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were a dominant sales fea-  
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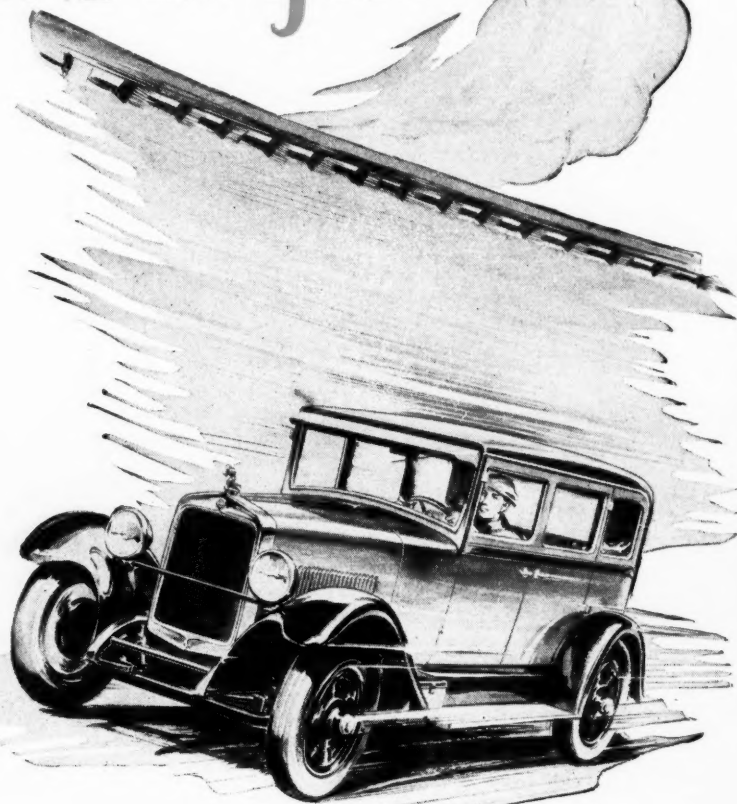
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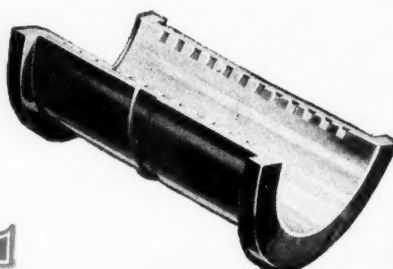
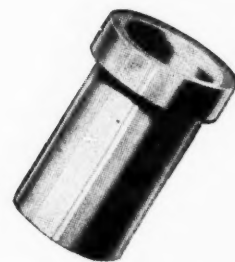
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# AUTOMOTIVE INDUSTRIES

VOLUME 58

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NUMBER 6

## In the Wake of the Shows— *Topics New and Old*

*Industry spends busy season threshing out such problems  
as prices, discounts, tire simplification, stock  
car racing and inventories of old models.*

By Norman G. Shidle

THE New York Show each year performs the function of the reveille call for the industry; the next few weeks, with a group of important local shows, the annual meeting of the Society of Automotive Engineers and various individual companies' sales conventions, savor much of a great army getting ready for assembly; and Chicago Show Week has many aspects of being such an assembly.

The last notes of reveille have died away. Assembly is over. The charge has been sounded—the charge for more profits and greater volume by automotive manufacturers of every kind which will last until taps are sounded for the 1928 campaign next December.

But here the already limping simile must end. For there is little of the hectic heat and haste of war embodied in the drive for automotive business and there is absence of hate and spite, for the various elements of the industry today are pulling together strongly to meet successfully the competition of other industries for a greater share of the consumer's dollar.

To those who spent considerable time in Chicago and New York during the shows and perhaps attended also the S.A.E. meeting in Detroit, it sometimes seemed as though everybody else in the industry were there too. But past experience indicates that however many one may see during the show weeks, there always are three times as many who greet the returning traveler with the question, "Well, what happened at the shows?"

The normal reaction to that question, of course, is to counter with "Why bring that up?"

That unquestionably is the best summary of the situation that can be given, but if the questioner happens to be the boss it sometimes seems as though this particular answer lacks just that touch of definiteness and profundity necessary to justify the proportions of the expense account just on its way through the accounting office. So the pleasure-worn—rather we should say the overworked—traveler has to try to sort out of that melee of events, rumors, personalities, ideas and happenings which have impinged on his consciousness some sort of orderly recitation of "What turned up during show weeks."

In trying to prepare for the arising of any such contingency in our own case, we sat down before we left Chicago and tried to pick out the high lights of the things with which we happened to come in contact. Every other voyager on the automotive seas probably has found entirely different things in both categories, but the following paragraphs embody our story and we'll stick to it.

Cars, prices, dealer discounts, the dealer-profit situation in general, tire simplification possibilities, stock car racing and the handling of inventories of old models in the presentation of new lines were among the topics which a good many automotive men seemed to be discussing with some vigor. While there probably was little that was entirely new de-



"Well, what happened at the shows?"

veloped, some of the questions, notably those of tire simplification and stock car racing, did become a good bit more clarified during the month of January.

As the Chicago show ended, the hope was expressed on all sides that passenger car price stabilization had been reached. As nearly as could be found out, the cuts which were made at and preceding the New York exhibit had the effect of stimulating large crowds to most of the local shows, but at the same time of causing a hesitation to buy. The result was that, despite record-breaking show sales by particular companies here and there, buying at the January shows this year was not heavy.

#### Business Picking Up

Nevertheless, practically everyone, both among dealers and manufacturers, seems agreed that plenty of people want to buy automobiles this year and that they are going to buy them as soon as they feel price stabilization has arrived. This general idea seems to be borne out by the fact that in a good many lines where buying was light in the early weeks of January, distinct gains were recorded in the last week or two. Every day that goes by without further price revisions being announced, following the Nash cut on Feb. 1, lends greater weight to the theory that prices actually are set for the spring selling season. In the opinion of many important executives, as a matter of fact, the public alone can gain from further cuts, as the industry at large already is presenting greater dollar-for-dollar value than ever before in the history of car manufacture.

Dealer discounts unquestionably are getting renewed consideration this year. Dealers themselves are far from being unanimous in a desire for greater discounts. Discussions during show week between dealers and manufacturers went over much the same ground that has been covered many times before.

If the dealer had a larger discount would he use it as a profit-making agency or would he trade it away as he already does with part of his present discount? In view of the generally low average of dealer profit, can dealers in the face of current merchandising expenses operate profitably on the discounts now in force? These and scores of other similar questions were talked over between dealers and manufacturers many times in hotel rooms during New York and Chicago show weeks.

Nothing in the way of a trend can be said to have developed. Discounts have been shifted in many cases as new models came out; sometimes the shift has been down, sometimes up. Sometimes within a single line it has been up on some models and down on others.

And there seems to be a good reason for lack of any standardized procedure. Not only have different companies different circumstances to meet, but also, as pointed out by one important student of factory and dealer merchandising matters, it is almost impossible to establish discounts on any scientific basis until there is available far more detailed information concerning the operations of a dealer's business than it is possible to obtain in a majority of cases at the present time. Thus, while no definite tendency as regards dealer discounts has been evolved, it seems certain that the next 12 months will see further moves and infinitely more scientific study of this problem than in the past.

Progress toward some real action on simplification of

tire and rim sizes was one of the important developments during this year's show season. For several months past there has been renewed agitation for action along these lines, many of the old and a few new elements entering into the informal discussions which have taken place. It remained for the tire session at the annual meeting of the Society of Automotive Engineers, however, to bring matters closer to a head than they ever had been before. Held in Detroit on January 25, that session was attended not only by more chief engineers of passenger car companies than any other S.A.E. session in many years, but also by authoritative spokesmen for the National Automobile Chamber of Commerce in the persons of Roy D. Chapin, president of the Chamber, Alvan Macauley, vice-president, and Alfred Reeves, general manager.

The story of that particular meeting already has been written in *Automotive Industries* of Feb. 4. Its specific achievement was to get the public indorsement for some concrete steps toward simplification of engineers high enough in the councils of their various companies to be able to speak for their organizations. Rim standards suggested by the S.A.E. Tire and Rim Division and tire standards arranged for step-by-step progress—suggested by the Rubber Association of America—were given general approval and detailed criticism.

It had been planned to hold a subsequent meeting of representatives of the N.A.C.C., the S.A.E. and the Rubber Association of America in Chicago on Feb. 1. Due to the inability of tire executives to get to Chicago at that time, however, that meeting was postponed. The



The charge has been sounded—the charge for manufacturers—which will last until taps are sou

new standards suggestions made by the Rubber Association are to be mailed out to N.A.C.C. members and comments are to be obtained. Mr. Chapin expressed the opinion informally that the present moves in this regard have brought out many very constructive angles and that it begins to look as though some real possibilities



exist for progress of constructive nature in the future.

How to get rid of inventories of old car models with minimum of grief and burden on the dealer was another problem which factory men seem to be thinking about pretty actively these days. There is nothing new about the problem, of course, but many feel that the practical need for a better solution is becoming more pressing as time goes on.

#### Attitude Isn't Hard-Boiled

The old methods of just assembling into finished cars all the materials and parts on hand at the factory for the obsolete model and then shipping the cars to dealers with instructions to get rid of them as best they could doesn't have many supporters any more. Dealers do get old models shipped to them for cleanup, to be sure, but few factories today are taking a hard-boiled attitude about the matter.

An inside discount, or what amounts to a price cut to the dealer, is, of course, the most usual method of trying to meet the situation. That this means has many objections is obvious. The only way it can be used, of course—unless the factory is to wink its eye at out-and-out retail price cutting which it officially doesn't permit—is as something to be given away to the customer on the old car which he is trading in. Not only does such a method penalize the cash buyer, but it also tends to give the owner an even more fictitious idea of the value of the car which he is trading in and thus gets him thinking in terms of used car values which make him just that much harder to deal with the

fact, have conducted just such sales with considerable success in many instances, although almost always in the face of severe factory opposition. A real attempt on the part of the factory, by means of national as well as local advertising, to keep the old models impressed as a part of the regular line is another possibility which some executives believe worthy of serious consideration.

Obviously the way to eliminate the problem would be for the factory not to announce a new model until all old inventories were cleaned out both at the factory and in the retail field. More factories honestly are trying to approach that ideal condition today than ever before, but it is not likely ever to be entirely achieved. Consequently, it is thought by many, the topic needs close attention. It is generally agreed, moreover, that the factory must in the future think very carefully of the dealer's possibilities in the matter, if the already close profit margins of many retailers are not to be further depleted.

Stock-car racing was easy to start a good many folks talking about, although some factory men purported to feel more or less indifferent to the whole question. The argument started at the S.A.E. meeting in Detroit and was continued apparently in hotel rooms and lobbies on numerous occasions in Chicago. In Detroit, it will be remembered, James Crawford argued that stock-car racing resulted in a manufacturer's incorporating in his product features of special value for that purpose and of little real use to the public. As a result, some engineers went to looking over the Chicago show cars with that thought in mind, but most of them didn't seem

to feel that this particular criticism of stock-car racing was much borne out by any considerable number of models. Capt. E. V. Rickenbacker, now assistant sales manager for La Salle, was in Chicago and indicated a very real regret that a dealer sales meeting kept him from being at the Detroit argument. Capt. Rickenbacker, it will be remembered, is president of the Indianapolis Speedway and chairman of the A.A.A. Contest Board, so he naturally is following very closely all the debates and trends as regards stock-car contests.

F. E. Moskovics offered a little advance information in New York as to what he planned to spring at the stock-car session at the annual meeting of the S.A.E. and we were, consequently, unusually interested to see the effect which the announcement of Stutz's withdrawal from domestic stock-car racing had on the meeting. Since that matter was discussed pretty fully in the report of that meeting in *Automotive Industries* of Feb. 4, it needn't be gone over again. Suffice it to say that the directness and frankness of presentations such as that of Mr. Moskovics always add vitality and real interest to meetings and contribute to the rapid clarification of discussion.

The importance of proper accounting and business methods among dealers, while not a new subject at all in the abstract, is getting some real specific study at the factories these days. Executives seem to be finding that determination of sound dealer policies as regards discounts, handling charges, delivered price of the vehicle and a host of other things is most difficult unless it is possible to get at the real facts about the dealer's business. Experience indicates, it is said, that such accurate facts are available in relatively few cases. For that reason as well as with the idea of helping retailers to get on a more stable



re profits and greater volume by automotive manu-  
nded for the 1928 campaign next December

next time he has a car to trade in for a new job.

There are many dealers and distributors—and a few factory executives who don't care to be quoted—who favor out-and-out bargain sales such as are conducted by nearly every other line of business in preference to the inside discount scheme. Dealers, as a matter of

basis, a number of factory men seem to be studying this matter with particular vigor at the moment. This subject, mentioned to almost any factory man having to do with marketing, will elicit a number of precise comments which indicate clearly the attention which is generally being given to it. Among the men who see this matter of dealer methods and accounting as of unusual importance is B. G. Weaver, of the General Motors Advisory staff, who was in Chicago during the early days of the show and who still was getting congratulations on his appearance as sales manager of the Battleaxe Six at the N.A.C.C. banquet in New York.

#### Prosperity for Parts Makers

One of the first persons we ran into in New York was David W. Rodger, director of sales, Federal-Mogul Corp., who sees some good business looming ahead this year. He doesn't look for the parts makers to have an easy time of it, but sees no cause for worry among those firms which have, during the last few years, worked effectively to get their own production on a highly economical basis and which have been building up their sales and distribution organizations in a sound, progressive manner.

Several successful parts makers, as a matter of fact, seem to have come to the conclusion that the generally downward trend of car prices is nothing to get much excited about. "Car prices have been moving down gradually for several years," one executive said, for example, "and the intelligent parts maker has been preparing for some time to meet the new conditions. The parts manufacturer today, it is true, does have to figure on getting a good proportion of any increased profits out of his own shop; he can't get them from higher prices. But it is remarkable what has been and can be done along that line. Even in the last year we have been able to improve our methods so much that we are set to make a better profit in 1928 than in 1927, even with slightly lower prices."

Another original equipment supplier said that he honestly believes a greater number of car makers every year are getting a full realization of the necessity for paying some fair profit to parts makers if stable sources of supply are to be maintained and if the industry as a whole is to be able successfully to meet the competition of other industries for a greater share of the consumer's dollar.

Along this same line, the attitude of several important passenger car executives was interesting. An opinion was expressed recently by Walter P. Chrysler to the effect that it wasn't a good thing for the industry as a whole to have parts makers selling original equipment at cost or less than cost.

Each of these executives agreed with Mr. Chrysler's opinion, but, naturally enough, they indicated that they weren't in any mood to go around asking for higher prices from parts makers. A feeling among certain passenger car executives, could be sensed, however, that some groups of parts makers were so busy trying to cut one another's throats that they couldn't hope for stable prices until they were willing to stand their ground somewhat more firmly. As one executive put it: "The reason for profitless prosperity in certain phases of the parts and accessory field is not so much that any cruel monster in the form of the vehicle manufacturer is grinding the supplier under an iron heel, as that the suppliers in many instances are stamping each other to death in their rush for the door of new business."

In the meantime, quite naturally, the vehicle makers

are taking advantage of possibilities to lower their own costs through close buying.

Paul G. Hoffman, vice-president in charge of sales of Studebaker, was found much immersed in dealer problems and vitally interested in developing merchandising methods and plans along such lines as would permit dealers to make a better profit on their investment. Mr. Hoffman, having spent a good many years on the wholesale and retail side of the automotive business, has a peculiar appreciation of dealer problems and seems inclined to think about factory policies quite strongly in terms of their effects on dealer possibilities.

In New York, as a matter of fact, we happened on an unusually large number of Studebaker men. A. J. Chanter, recently appointed manager of branches, when asked how many cars Studebaker is going to sell in 1928, quoted a motto of A. R. Erskine's which seems worth repeating. "Go as far as you can see," Mr. Erskine is said to have remarked, "and see how far you can go." That prediction for the year probably will come as close to what actually eventuates as most other predictions made at this time—including our own. A few minutes talk with W. S. James, head of the Studebaker Research department, developed a few informal comments about brakes, while E. C. Newcomb, technical assistant to the president, was interested in giving us the relation of modern atomic theory to metaphysics and philosophical speculations.

Harry Horning, Waukesha's chief, fresh from a trip abroad, had gathered a wealth of new impressions, among which was the thought that the principal European countries were most earnest in their desires to build up their own automobile industries and that while parts sales could be made, capable representation was much needed.

In the sanctum reserved for guests of honor at the M.A.M.A. banquet D. C. Fenner of Mack and C. C. Hanch of the National Association of Finance Companies were found among the early arrivals and discussing the workings of compulsory insurance as exemplified by the Massachusetts experience. The former was fresh—or rather weary from a two-days' session of work on proposed revisions of the Denison bill—now on the Congressional calendar—for regulating the operation of trucks and buses.

#### Still Up in the Air

This whole matter of compulsory insurance, it appears from talking with various executives who have been studying the proposition, still is very much up in the air. The Motor Vehicle Conference Committee has thus far been strongly opposed to the passage of any compulsory liability laws. There is more than one executive in the automotive industry today, however, who is privately beginning to wonder whether or not some such legislation is not bound to come in the long run.

While compulsory liability laws undoubtedly would set up additional sales resistance of no mean proportions, particularly perhaps in the used car field, it cannot be denied that there are strong arguments in favor of such legislation from the purely public angle. Should it become evident that laws of this character were likely to become widespread, it might be the wise thing, in the opinion of some of these executives, to abandon unmitigated opposition to the idea and strive to see that such laws as are enacted are equitable and as fair as possible to automotive interests.

So far, of course, this view of the situation is much in the minority so far as the automotive industry is concerned, but it has gained enough adherents in recent months to be of more importance today than it was a year ago.



# Longer Car Life—Will It Affect Replacement Sales?

*Owners apparently less willing to trade in automobiles now after one or two years of service. Market last year fell below expectations. Stable styles a factor.*

By John C. Gourlie

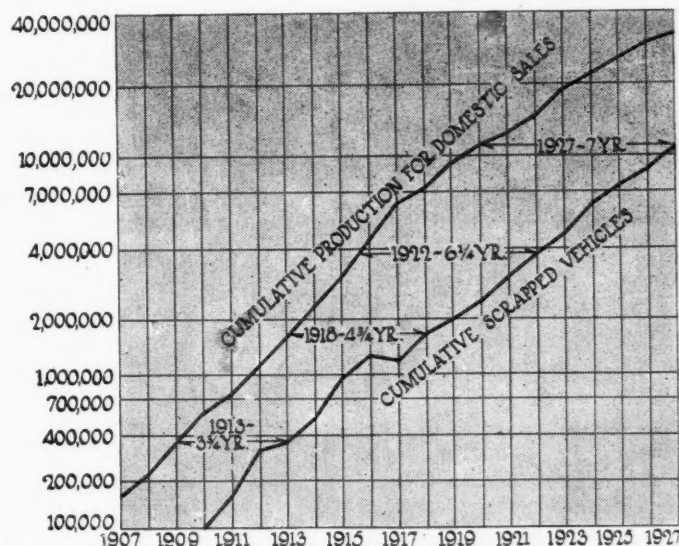
THE present highly competitive situation in which the automotive industry finds itself, the result of production capacity considerably in excess of immediate demand, has been attributed to many factors in recent years. Among those frequently mentioned has been the increasing life of cars, but it is questionable whether or not the full importance of this particular item has been altogether recognized.

The error into which tire manufacturers fell after the introduction of the cord tire will be remembered. They continued to plan production based on a replacement market which in turn was calculated on the average life of a fabric tire, failing to see that the greatly increased life of the cord casing would temporarily at least retard the expansion of replacement business. Overproduction and losses were the consequence.

Is there danger of an error on the part of automobile manufacturers similar in character though not in degree?

Of course in automobiles there has been no such fundamental change as took place in tires with the production of cord casings. But if, as there seems good reason to believe, the useful life of the automobile has been advanced more than a little in the last few years, there is justification for revising many of the prevailing estimates of the replacement market for automobiles, and there may be reason to doubt the ability of the trade to merchandise profitably a record number of units this year.

The methods for computing the average life of a motor car are more or less familiar to factory executives through their statistical departments, and figures of this sort are the basis for the accompanying chart. A gradual gain in motor vehicle life is shown, their main value being in revealing a trend which is worthy



Trend of car life since 1913

of consideration.

What is more important, however, is that cars are apparently not being turned in for trade as early in their lives as was the case a few years back. Whether this will ultimately add considerably to the average life of a car is, in a sense, not the vital question. The fact is that while an almost unlimited number of used cars can be sold if the price is cut low enough, the market for new vehicles in any particular year largely rests upon the willingness of owners with comparatively up-to-date and useful cars to turn them in

at a sacrifice to obtain brand new vehicles.

The replacement market in 1927 did not come up to general expectations. Instead of amounting to well over 2,000,000 vehicles, as had been freely predicted, it fell some distance below this mark, according to recent preliminary estimates. To just what extent this was the cause or the effect of the smaller market for new cars last year as compared with the previous year is not subject to statistical demonstration, but even an off-hand appraisal of the current practices and preferences of motor car owners will shed light on the question.

A few years back it was customary for persons of means to turn in their cars every year for new ones, not primarily because of the mechanical advances of motor car construction in the interim, but because the paint job had deteriorated appreciably and because the new cars were much superior in style. It is, therefore, probably not only because the recent cars are more durable mechanically but also because the lacquer and the style wears better that there is not the same disposition to acquire new cars as frequently—if that is, indeed, the influence now bearing heavily upon the market.

Even when the finish begins to show undesirable

signs of wear it is now possible, due to the multiplication of refinishing stations, to obtain a lacquer finish hardly distinguishable from new and at a comparatively insignificant price.

The heavy depreciation in used car values that went on in the last two years is another factor that makes owners reluctant to trade for new cars. This depreciation was forced by the decline in new car prices and the trend will be accentuated in the early months of this year if the price cuts of the last month or two have the accustomed effect.

Calculations of car life do not enter quite so intimately into plans for automobile production as they do into tire output, for reasons easily discernible. Tire sales are largely based on a replacement market which can be very closely estimated provided the average life of the tire remains constant. People will be disinclined to buy new cars if business is poor or other restrictive factors are present, but they will continue to run cars about as much as ever and to need as many tires.

Yet so long as financial and industrial conditions are sound, automobile companies in the main count on a very large replacement business, which has been calculated as growing very rapidly toward an approximate peak not many years hence of perhaps 4,000,000 cars annually. Something of this sort will undoubtedly happen eventually; the only point on which plans can go wrong is the rate of gain.

The whole problem, then, is whether the current re-

placement market is as large as has been generally considered, or, viewed in another light, whether the expected number of owners are willing to turn in their comparatively new cars for the 1928 products of the industry.

Perhaps it will be argued that the question is not really so important—because if enough sales pressure is applied a record, or close to a record, number of new cars can be sold despite reluctance to trade on the part of the public. The confident predictions of factory executives at show time, together with the heavy production schedules under way, make it plain that the stage has been set for a year approximating the best the industry has had.

But if a real buying demand is not available, formed by owners willing to accept sacrifices on their used cars, records can only be achieved by the sort of sales pressure that bears heavily upon the dealer organization, which, to all appearances, is ill prepared for further trading losses. Whether or not it is just to say that dealers generally are "loaded" with used cars the fact is that the retail organization would be much better off with fewer used cars; and a further fact is that most of these used cars were acquired before price cutting on new cars brought the need for further depreciation of used car values.

A manufacturer interested in improving the stability and enhancing the prosperity of his dealer organization in 1928 will want to know, primarily, how many cars can be sold without forcing the market.

## More Effective Automotive Catalogs Urged

THE variation in practices concerning the publication and distribution of catalogs, together with the wide dissimilarity in costs for comparable printing and mailing jobs, would seem to indicate the need for more study by automotive manufacturing executives of this important item of sales expense, according to a survey recently made by the Motor & Accessory Manufacturers Association in cooperation with the Chilton Class Journal Co., publisher of *Automotive Industries* and other automotive trade papers.

The survey did not depreciate the value of catalogs as part of a distribution program, but it did indicate that more effective material in some instances could be included. The lack of knowledge of catalog practices revealed by some executives who replied to a questionnaire on the subject might be interpreted as showing that too much of this important work was left to subordinates.

In reply to the questionnaire 43 companies gave comparable information. The average company was distributing 45,000 catalogs a year at a cost of \$18,000. The 30 manufacturers selling both to manufacturers and the trade were distributing on the average, 55,000 catalogs each, at an approximate cost of \$19,000 per year. Five manufacturers selling only for original equipment were circulating, on the average, 13,000 catalogs, at an average cost of about \$12,000. Another group of eight manufacturers having no original equipment business, that is, selling only to the trade, were issuing approximately 33,000 catalogs each, at an average yearly cost of \$7,000.

While the M. & A. M. A. was making this study, the Chilton Class Journal Co. made an inquiry relating to the use of catalogs in the trade. A questionnaire was answered by 200 wholesalers, indicating a heavy waste in catalogs, while a similar condition was shown by an-

other survey which covered 100 repair shops, including a good many car dealers, and 35 accessory stores.

The inquiry among wholesalers revealed the following facts:

- 30% file less than one-half the catalogs received.
- 10% do not keep an indexed file of catalogs.
- 40% find it difficult to keep catalogs filed for various reasons, among them miscellaneous sizes and shapes, quick obsolescence of products and prices, and difficulty in cross-indexing contents.
- 46% carry 100 or less catalogs in file.
- 38% carry 100 to 500.
- 16% carry more than 500.
- 19% state that information in catalogs is insufficient.
- 75% indicate that they would prefer a condensed, general catalog in one or a few volumes, instead of numerous individual catalogs.

The questionnaires returned by repair shops and accessory stores indicated the following facts:

- 38% of the repair shops and 64% of the accessory stores do not keep an indexed file of catalogs.
- 48% of the repair shops and 64% of the accessory stores file less than one-half of the catalogs they receive.

These merchants found it difficult to keep catalogs filed for reasons similar to those stated by the wholesalers.

- 75% of the repair shops and 80% of the accessory stores have 50 or less catalogs on file.

Virtually all of the repair shop and accessory store proprietors wanted condensed, general catalogs.



# England and Germany Lead Europe in Engine Progress

Diesel development slowing down on Continent, says H. L. Horning, back from three months' visit. Resident representatives needed by U. S. companies.

By David Beecroft

**H**ARRY L. HORNING, president, Waukesha Motor Co. and former president of the Motor & Accessory Manufacturers Association and the Society of Automotive Engineers, has recently returned from a three months' business trip that took him through several European countries, including England, France, Belgium, Italy, Germany and Switzerland.

Besides visiting factories, Mr. Horning did a great amount of traveling by motor through the different countries for the purpose of studying general conditions more closely.

Being an engineer, Mr. Horning delved deeply into matters of engineering and is convinced that the foremost work in internal combustion engineering is being done in England and Germany, with England leading all European countries by a wide margin.

From the commercial viewpoint perhaps the most important deduction of the trip is that it is imperative for American manufacturers to have qualified and reliable representatives residing in the different countries that business is being done with. This is necessary so as to be in constant touch with changing conditions, both industrially and politically.

Diesel engine development for automotive use is quieting down in practically all countries, the explanation being that the low price of gasoline has so reduced the cost of vehicle operation that there is not the acute interest in the Diesel design that has been shown in the past. Mr. Horning reports that in Germany the development of the Diesel engine for motor trucks has greatly subsided. There seems to be some development of the Diesel engine for farm tractors.

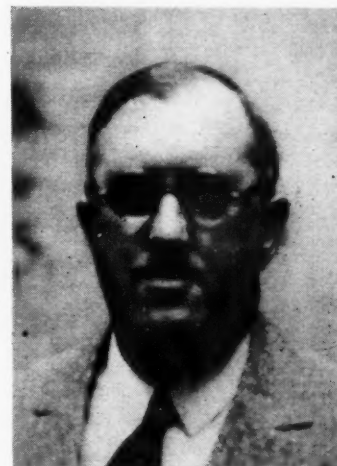
Mr. Horning found in his motoring through Germany a virtual dearth of motor cars in the smaller cities and rural areas. The sale of motor vehicles to the masses of population throughout the country has scarcely begun. Mr. Horning is of the opinion that Germany, to protect its own manufacturers from almost total elimination, was compelled to make the recent drastic increase in the tariff on parts from foreign companies.

The military and commercial development in automotive vehicles in Europe was very apparent to Mr. Horning, and the most conspicuous aspect of this is the development of six-wheelers of all sizes for military service.

In England, Germany, and Italy most unusual progress has been made in the development of motor buses as well as in their use. These seem to be further

developed than any other division of the motor industry, as compared with America. In Germany there is a great inter-city motor bus business in which very heavy buses with 100 hp. six-cylinder engines are used, Mr. Horning reports. The use of the six-wheel design for buses is developing very rapidly in England, Ger-

*Harry L. Horning, who has recently returned from Europe. He says, among other things, that reliable resident representatives are needed by American automotive manufacturers in foreign countries*



many and France. It is true that this development is just getting underway, but it gives evidence of very rapid progress. In Rome the Twin Coach type of bus is taking the place of the street-car.

Motor vehicle design in Europe is leaning toward the curve, the deep radiator design seen at the New York show having come to the foreground in Europe a year ago. The high, narrow radiator is very definitely "it," so far as Europe is concerned. The design must also be very simple and clean, says Mr. Horning.

American cars are greatly admired by the Europeans, and unless some drastic means are adopted to stop the invasion, the Continent will soon be American in the larger sizes of cars. The development of the lower and middle-class buying power is slow. Class distinction has had a profound effect on the industry, as it is not considered the smart thing to drive one's car.

When the old Victorians in England, the military and hereditary aristocracy of Germany and France, the Old World upper class instinct of Belgium and Italy pass out in the next two generations, these social fallacies will pass with them, much to the benefit of the automobile industry, says Mr. Horning.



The Stoewer car of Germany is built by the two Stoewer brothers, Emil (above) and Bernhard (below) Bernhard (right). The company of which they are the heads also builds a line of commercial vehicles. It was founded by their father



By R. L. Cusick

THE United States hasn't a monopoly on famous automotive brothers. As stated in the first article on this subject (issue of Dec. 24), the particular virus that is responsible for causing brothers to team together in automotive enterprises is quite cosmopolitan and operates as effectively in Europe as in this country.

In the two articles which have gone before, dealing with American brothers, 35 groups in all were named, each group consisting of from two to seven members and each entitled in its own way to a niche in the Automotive Hall of Fame.

Europe can't equal that record, but on a relative basis her showing is good. For every car built in Europe, eight are turned out in the United States. That suggests the great difference in the size of the industries. Yet we find 10 prominent sets of automotive brothers scattered through France, Germany and Belgium, as compared with our 35 here in America.

France heads the list with five sets. Among them are the brothers Maurice and Felix Goudard, who are responsible for the destinies of the Solex Carburetor Co., the biggest carburetor manufacturing concern outside the United States.

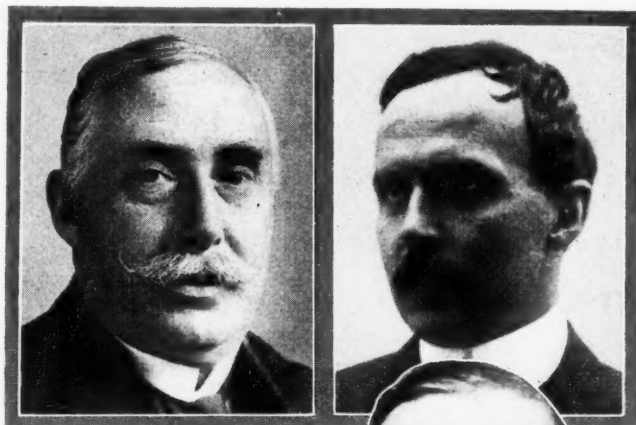
The Goudard brothers, in association with Marcel Mennesson, formed their company in 1907. At the present time they equip 70 per cent of French automobiles, including Citroen, and have branches in the

# Introducing Some Automotive

Ten groups have been prominent development in France,

United States, Canada, England, Germany, Italy and Spain.

Maurice Goudard, president of the company, was born in 1881. Graduating from the Ecole Centrale des Arts et Manufactures in 1905, he established his business two years later. In 1924 he was elected president



The three Farman brothers of France. Above—left to right—Dick and Maurice Farman. Right—Henry Farman



of the French Association of Automobile Accessory Manufacturers. A frequent visitor to the United States and a close student of American methods, he is recognized as one of the keenest and most alert business men in the automobile industry.

Felix Goudard, seven years younger than his brother, is also a graduate of the Ecole Centrale des Arts et Manufactures. He joined his brother three years after the company was formed and has remained with it as business manager ever since. Joining the army in 1914, Felix Goudard was one of the most brilliant French aviators during the war.

Also in France we have the three Farman brothers. Born in Paris of an English father and a French mother, the boys, Henry, Maurice and Dick, inherited the British love of sports and revealed it at an early date as expert bicycle riders. The automobile move-



# European Brothers

ently identified with industry's  
Germany and Belgium.

ment attracted them, and both Henry and Maurice took part in the early town-to-town races in France, mostly on Panhard & Levassor cars.

They were not long in getting into the automobile business as dealers and garagists and soon built up one of the most important businesses of this kind in France, on the Boulevard Pereire, Paris. Before Wilbur Wright had come to France, the flying movement had engaged the active attention of both Henry and Maurice. The elder brother was the first man to fly a kilometer in a closed circle, using a Voisin biplane. Maurice Farman was attracted to the flying movement a little later and captured many of the early records for distance and endurance.

In 1907 Henry Farman opened a small workshop equipped with a vise and a few hand tools, for the construction of airplanes; the following year he moved his shops to the edge of the military camp at Chalons, and after a couple of years came back to Paris and opened works on the site of his present factory. For several years Maurice Farman manufactured airplanes independently of his brothers, but a little time before the war the three brothers became united in the Farman Brothers Aviation Co. In 1914 the factory in the suburbs of Paris covered an area of 215,000 sq. ft.; in 1917 it had grown to 1,000,000 sq. ft., and the number of hands had increased from 600 to 7000. From an output of 25 planes a month, the firm increased to more than 300, or rather more than one per working hour.

After the war the Farman brothers devoted all their attention to commercial aviation. The firm is the only one in France building planes and engines and operating them on passenger carrying and mail lines. An automobile section was added immediately after the war, and in this the firm produces a well-



Germany has had two sets of Reichstein brothers, representing two generations. At the right is Carl Reichstein, Sr., who founded the Brenna-bor works with his brothers Adolph and Hermann. Four of Carl's sons are now running the business. Top—left to right—Dr. Carl Reichstein, Jr., and Walter. Bottom—Edward (left) and Ernst



known, high grade six-cylinder model.

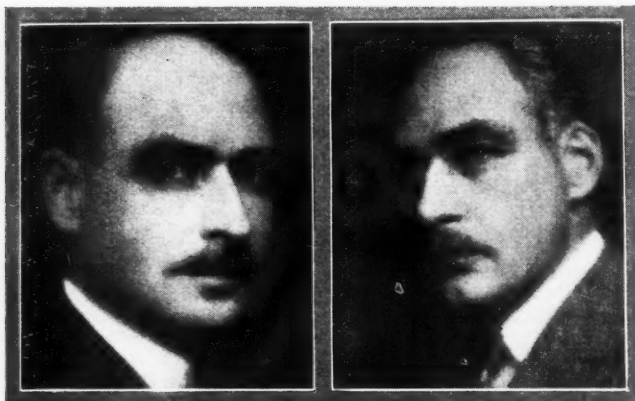
The Michelins, of France, are known throughout the world as tire-builders. Sons of a rubber ball maker at Clermont Ferrand, Andre and Edouard Michelin started active life respectively as a map maker and a painter. Their parental factory not being in a flourishing condition, they returned from Paris to Clermont Ferrand, and were accidentally led to take up the construction of air-filled tires.

Automobile manufacturers in the early days being skeptical of the practical value of pneumatics, some of

the first tires were fitted on a horse-drawn carriage, and in 1895 the Michelin brothers built an automobile which was fitted with their tires and started in the Paris-to-Bordeaux race. It finished ninth. At present the biggest tire manufacturers in Europe, the brothers have in addition to their main factory at

The famous tire builders of France, Edouard (left) and Andre Michelin





*The Goudard brothers of the Solex Carburetor Co.  
Maurice (left) and Felix*

Clermont Ferrand, important works at Milan, Italy, and in England.

In 1902 the brothers Maurice and Georges Sizaïre, then young men in the early twenties, designed and built an automobile embodying their own ideas, and placed it on view at the Small Inventors' Exhibition, held near the Eiffel Tower, in Paris. The car attracted the attention of business men and the result was the formation, in 1905, of the Sizaïre Naudin Automobile Co. Maurice Sizaïre was chief engineer, his brother Georges had charge of production and road tests, and Louis Naudin worked on the test department.

They produced the cheapest car ever marketed in France, a runabout selling for \$590. Maurice Sizaïre was a prolific inventor. His automobile had a three speed transmission with direct drive on all three gears; a single plate clutch; independent springing for the two front wheels; a steering gear exactly like the well-known Ross; a plain tube radiator and a single-cylinder engine.

#### Limit of the Long Stroke

In 1911 Maurice Sizaïre built a supercharged racing engine, but the French club refused to allow it to start in its race. The firm raced considerably, Georges Sizaïre and Louis Naudin being the drivers, and under this program they developed the long-stroke engine until they had one-lungers of 4-in. bore and 10-in. stroke. The limit was reached when the drivers claimed they could not see over the top of the hood.

In 1912 the Sizaïre brothers left the Sizaïre Naudin Co., which later passed out of existence, and formed the Sizaïre-Berwick Co., a Franco-British combination building a high-grade car. When war broke out Georges was taken as a staff car driver and his brother was put in charge of an army automobile repair park. After the war the Sizaïre Berwick Co. was transferred from France to England. In 1923 the two brothers formed the Sizaïre Brothers Automobile Co., which is still in existence, with a factory in the suburbs of Paris. Maurice Sizaïre is chief engineer and Georges Sizaïre has charge of experimental work and tests. The Sizaïre-Berwick Company having been transferred to France, Maurice Sizaïre is attached to it as chief consulting engineer. The respective ages of the brothers are 47 and 49.

There were originally three Renault brothers. Born in Paris Nov. 12, 1877, son of a wholesale linen draper, Louis Renault took up automobiling as a hobby and bought his first machine, a De Dion Bouton tricycle, when he was 20 years old. He started building his own

automobile in 1898. It was fitted with a De Dion Bouton engine, but was distinctive in having a direct drive rear axle, with a differential, a feature for which Renault secured patents. For several years about 12 French automobile manufacturers paid Renault a royalty of one per cent on the retail price of their chassis for the use of this patent. Later the validity of the patent was quashed in the courts.

At the end of 1898 Renault started in business in partnership with his elder brother Marcel, under the title Renault Freres. Later they were joined by the their brother Fernand. For several year the Renault brothers were assiduous and successful competitors in the town-to-town races held in France and other European countries. In 1903 Louis and Marcel each drove a car in the ill-fated Paris to Madrid race, and while taking a sharp bend near the village of Couhe Verac, Marcel Renault overturned his car and suffered fatal injuries. This accident, in addition to reducing the partnership to the two brothers, put a stop to the firm's racing career for a short time.

In 1909 Fernand Renault died at the age of 44, thus leaving what was then the biggest automobile business in Europe in the hands of Louis. Since then Louis Renault has handled the business alone and so great is his activity that there is not any branch of his huge business over which he does not maintain direct control. Employing 30,000 hands, having a factory in the suburbs of Paris covering an area of 245 acres, it is obvious that he must have departmental heads, but it is a recognized rule that whatever the department the final decision in all matters of importance rests with the man who founded the business nearly 30 years ago.

In Germany four different sets of brothers have attained prominence as automobile builders. Two sets represent two genera-



*The Minerva car is built in Belgium by the three De Jong brothers, Sylvain (at right), Henri (lower left) and Jacques (lower right)*



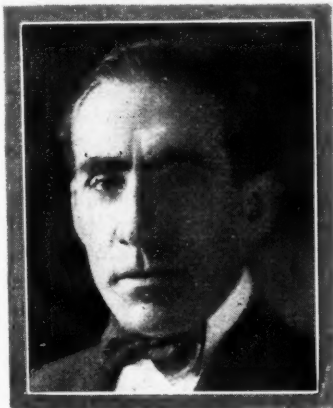
tions of the same family. These are the Reichsteins.

Carl Reichstein, now 80 years of age, together with his two brothers Adolf and Hermann, founded a workshop in 1871 with 15 workmen for the production of perambulators. The factory grew continually and the



perambulator business became an unprecedented success, not only in Europe but also overseas. During the last years before the war 300,000 perambulators were produced annually. In 1886 the brothers took up the production of bicycles. This branch too was a great success and today the Brennabor works have the largest bicycle production in Europe, viz., 500 machines per day. Carl Reichstein was in due course honored officially by receiving the title of "Kommerzienrat." He took special interest in the bicycle business and sports and for many years was chairman of the Association of Bicycle Makers. His brothers, Adolf, the senior and a bachelor, and Hermann, are both dead. But Carl Reichstein has four sons living.

In 1903 the works entered the motor field against the opposition of Adolf and Hermann Reichstein, who wanted to keep to the perambulator and bicycle business. The production of motor cycles was started, but a few years later was given up, the business in this line being very slack at that time.



*Louis Renault, who started in the automobile business in France with his brothers Marcel and Fernand and is now the only survivor of the famous trio*

department of the four-cylinder car. The fifth son, Fritz, air-fighter during the war, fell in 1917 after three years of meritorious military service.

The four brothers are keen business developers and highly efficient engineers and production experts. They have paid repeated visits to American concerns and have a fine production plant. The works, in Germany chiefly known by the trade mark of "Brennabor," employ more than 6000 workers.

Two brothers, Emil and Bernhard Stoewer, are at the head of the well-known Stoewer-Werke A. G., of Germany. The company was founded in 1896 by Bernhard Stoewer, Sr., father of Emil and Bernhard, Jr., and the two sons were taken in as associates.

Production first consisted of machine tools and bicycle parts, but in 1898, having made successful attempts in the construction of internal combustion engines, they decided to take up the production of motor vehicles. In 1899 the old gentleman resigned and left the works to his sons.

From a small beginning the works developed very rapidly and the buildings today cover 650,000 sq. ft. of ground. Production is confined to two types of passenger car chassis with various models of bodies and tractors.

The old gentleman died in 1908. Emil Stoewer, the elder of the brothers, is the active manager of the

In 1906 they entered the motor car field successfully, confining themselves prudently to few types and adopting working methods akin to those in American mass production. Carl Reichstein resigned in 1916 and left the works in charge of his four sons. These are Dr. Carl Reichstein, engineering chief of the works and responsible for the production of the new six-cylinder car; Walter, commercial chief of the works; Ernst, chief of the purchase department, and Edward, chief of the production



*Maurice (left) and Georges Sizaire, brothers who have long been prominent in the French and British industries*

works. Bernhard is the technical adviser of the board of directors.

The Opel car of Germany is produced by three Opels who are brothers. The works were founded in 1862 by Adam Opel for the production of sewing machines and bicycles. Adam Opel was father of five sons, who were keen adherents of bicycle sports. In 1895 Adam died and his sons, under the leadership of Carl, took over the factory.

Carl, who later received the title of a baron, being then called Carl von Opel, after having previously been appointed a Kommerzienrat, died at the age of 57 on Feb. 16, 1927. Wilhelm, Heinrich and Fritz now are in sole charge of the works, as the fifth brother fell in the war.

#### Built First Cars in 1898

In 1898 the factory first turned to the manufacture of motor cars, building under license from Renault and later from Darracq. Gradually, however, the Opels developed their own models and the new branch of the work flourished.

The Opel brothers, similar to the Reichstein brothers of the Brennabor works, have made careful studies of mass production as carried on in America and have organized a plant which can produce 400 cars a day.

Lastly we come to the De Jongs of Belgium. Originally a journalist, attached to the staff of the Havas News Agency in Brussels, Sylvain de Jong founded the Minerva Automobile Co., in 1897, with a capital of \$40,000. At that time the concern was known as the S. de Jong Co., and instead of automobiles it manufactured bicycles, for De Jong was interested in mechanical sports. Very shortly afterward motorcycles were added to the line, and in 1902 the first automobiles were built under the title Minerva.

There are two other brothers in the family, both of whom joined the company at an early date. Sylvain de Jong took technical control, while Jacques de Jong is works manager and head of the repairs and spare parts department.

In 1922 Minerva celebrated its twenty-fifth anniversary; in 1923 it absorbed the Sava Automobile Co. and turned the works into a body-building department. In 1925 it added the Auto Traction Co. for the construction of trucks and tractors. The factory now occupies an area of 10,000 sq. yd. It has 1600 machine tools, 250 electric motors developing 3600 hp., 3800 factory men and an office staff of 500.

# Internal Gears Used *in* Detroit 3 and 4-Speed Gearsets

*Both units offered for original equipment. Spur and internal gear reductions located in different compartments of transmission case to facilitate lubrication.*

By A. F. Denham

**A**NNOUNCEMENT has been made of the adoption of speed in two types of transmission manufactured of internal gear reductions for the next-to-high by the Detroit Gear & Machine Co. One of the two new gearsets is a four-speed unit and the other a three-speed. The spur and internal gear reductions are located in different compartments of the transmission case, this arrangement being considered advisable from a lubrication angle.

Both units are being offered to the automobile industry for original equipment. In the four-speed transmission the fourth speed is the direct drive; the third is obtained by means of the internal gears and gives a reduction of either 1.31 or 1.41, while the two lower speeds are obtained in the usual way by means of spur gears. The low speed is intended for emergencies only, and the shift for the other three speeds is the same as the S.A.E. standard shift for three-speed gears. The emergency low-speed gear is engaged by latching the lever out to the left and then pushing it forward. This is claimed to have an advantage over the backward latching arrangement in that it provides a more natural shift from low to second speed.

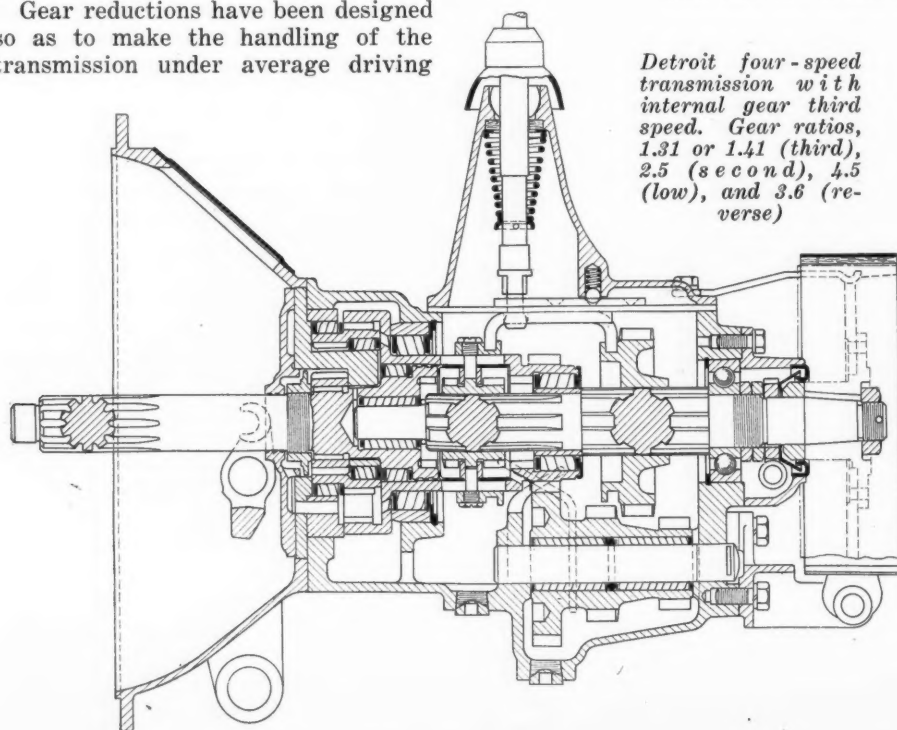
Gear reductions have been designed so as to make the handling of the transmission under average driving

conditions identical with that of a normal three-speed unit, the emergency low being required only for starting on up-grades and for pulling out of mud or sand pits. Two sizes of the four-speed transmission are being offered, one designed for cars with an engine torque up to 150 lb.-ft., the other for cars with engines developing a torque of up to 220 lb.-ft.

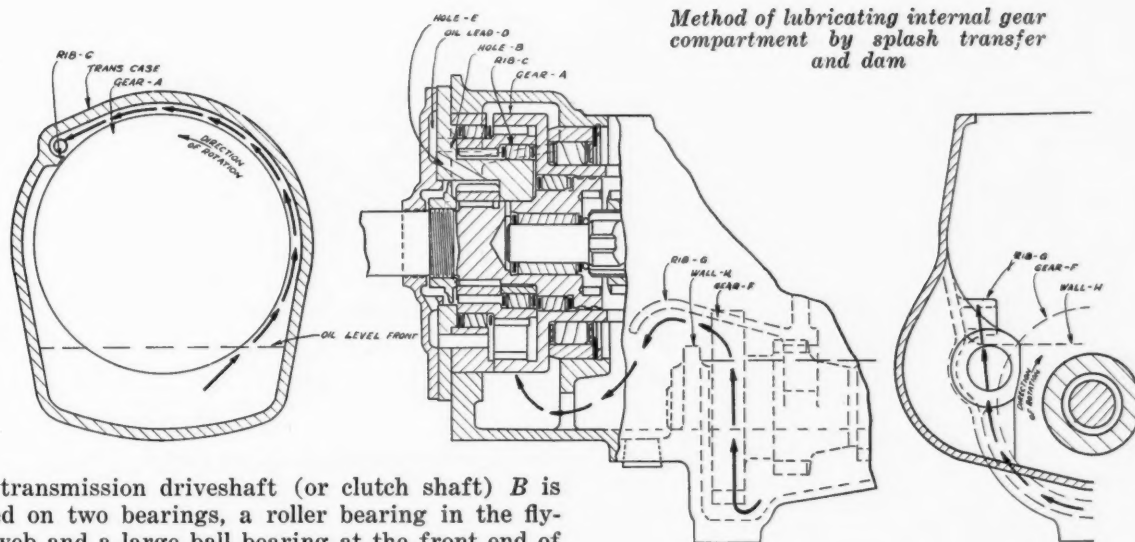
The three-speed forward transmission, which is offered in three sizes, with ratings of 115, 170 and 220 lb.-ft. of engine torque, has the same type of internal gear reduction for the second speed as the four-speed unit has for the third speed, the "emergency" low gear of the four-speed unit being eliminated. Of course, the gear reductions in this unit differ somewhat from those of the four-speed unit, the steps being slightly larger, to take care of the spread of tractive effort required with a lesser number of gears.

Since the internal gear assemblies of both the three and the four-speed units are practically identical in design, a description of one will cover both. Referring to the attached drawings, it will be noted that the transmission case is divided into two parts with a wall in between, the object being to insure an abundant supply of lubricant to the internal gears. In the front (or internal gear) compartment the oil is always kept up to the level of the top of the baffle wall A, while the main supply of lubricant is in the rear compartment. If the oil supply in the transmission becomes scanty, the rear compartment will empty first, and a warning will be given to the driver by the increased noise from the spur gears, while the comparatively more sensitive internal gears are still well lubricated.

One of the features of the transmission is the bearing mounting of the internal gear unit. All but one of the gears are supported directly by bearings, the only exception being the spool gear, whose overhang, however, is less than half the distance between its supporting roller bearings.







Method of lubricating internal gear compartment by splash transfer and dam

The transmission driveshaft (or clutch shaft) *B* is mounted on two bearings, a roller bearing in the fly-wheel web and a large ball bearing at the front end of the transmission case. At its rear end this shaft carries an integral internal gear *C* which serves as one member of a positive clutch, the other member *D* being formed by a sliding spur gear splined to the main shaft. This is the direct drive clutch. This sliding gear *D* forms a unit with another one, *E*, farther to the rear, which meshes with internal gear teeth on the spool gear *F* for drive in third (four-speed) or second (three-speed). The spool gear *F* is carried on two roller bearings, one, *R*<sub>1</sub>, near its front end, mounted directly in the transmission case; the other, *R*<sub>2</sub>, in the form of a pilot which is carried on the transmission main shaft *G* at the rear end of the spool gear *F*.

The internal gear *H* at the front end of the spool gear meshes with the intermediate external-internal drive gear *I* for the next-to-high reduction, the internal gear of the intermediate gear in turn meshing with a spur gear *K* splined to the transmission main shaft, the latter being held in place by a lock ring or nut at the front end of the transmission case. The intermediate gear itself is mounted on two roller bearings, directly opposite the internal and external gears respectively, giving a rigid support for the gearing.

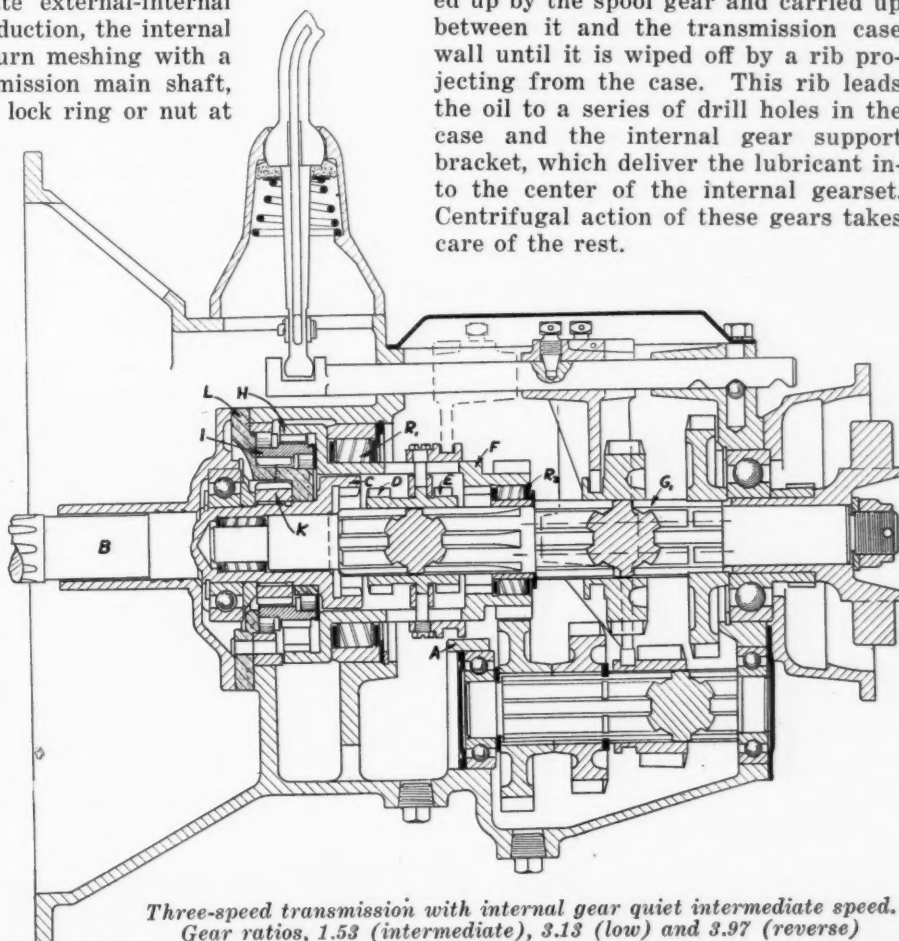
This form of construction is made possible by a bracket *L* extending into the transmission case and bolted to the front end of the case between the case itself and the front cover plate. This bracket carries the roller bearing opposite the spool gear external teeth, and also an eccentric outer race in which is mounted the other bearing forming the support for the intermediate gear.

The two diameters of the intermediate gear on which the rollers bear are finished by grinding. By using an eccentric outer race for the front roller bearing of the intermediate gear, the eccentric mounting required to enable the intermediate gear to mesh with its drive gear at the bottom and with the spool gear

at the top is obtained without boring off-center holes in the transmission case. The spool gear, of course, is concentric with the main shaft.

The oil level in the internal gear compartment of the case is maintained at the correct height by a baffle wall between the two compartments. Oil is delivered to this compartment by means of the countershaft drive gear, which is driven by the spool gear, and throws oil from the rear compartment against a rib on the side wall of the transmission case, from which it splashes into the front compartment. Surplus oil flows back to the rear compartment over the baffle wall.

Oil in the front compartment is picked up by the spool gear and carried up between it and the transmission case wall until it is wiped off by a rib projecting from the case. This rib leads the oil to a series of drill holes in the case and the internal gear support bracket, which deliver the lubricant into the center of the internal gearset. Centrifugal action of these gears takes care of the rest.



Three-speed transmission with internal gear quiet intermediate speed. Gear ratios, 1.53 (intermediate), 3.13 (low) and 3.97 (reverse)

# "Running-in" of Journal Bearings Increases Safety Factor

Friction loss also reduced according to findings of Bureau of Standards engineer. Results of study are outlined in paper recently read before the A.S.M.E.

THE effect of "running-in" on journal bearing performance was dealt with in a paper read before the American Society of Mechanical Engineers at its last general meeting, by S. A. McKee, mechanical engineer of the Bureau of Standards. It is known that the friction coefficient of a journal bearing is a function of the expression  $zn/p$ , where  $z$  is the viscosity of the oil used, at the temperature of the bearing;  $n$ , the speed in r.p.m., and  $p$ , the load on the bearing in lb. p. sq. in. The friction coefficient is substantially a straight-line function of this expression.

There are, of course, other factors which affect the coefficient. In the region of stable lubrication the shape of the curve for a symmetrically loaded bearing is affected by the ratio of clearance to diameter,  $c/d$ ; the ratio of the length to diameter,  $l/d$ , and the deviations of the surfaces of the journal and the bearing from the true cylindrical form.

The effect of the amount of lubricant supplied to the bearing probably is negligible, except where the supply is insufficient to maintain a complete film or where the pressure at which the oil is supplied is high enough to materially affect the lines of flow of the oil in the bearing.

It is probable that the point of minimum friction and the portion of the  $zn/p$ - $f$  curve to the left of this point are affected by the same factors, and in addition by the oiliness of the lubricant, the materials of which the journal and bearing are made, and the roughness of the working surfaces. The effect of changes in this latter factor due to running-in was discussed in Mr. McKee's paper.

The tests were made on a special friction testing machine comprising a freely suspended frame. A shaft has bearings on this frame, and on the shaft are mounted the big ends of four automobile-type connecting rods. These rods occupy a horizontal position, the two outer ones extending from the shaft in one direction and the two inner ones in the opposite direction. The small ends of the connecting rods are connected to eye bolts, two of which are adapted to slide

through holes in a cross-member of the frame, and load is applied to the bearings by two calibrated coiled springs surrounding the sliding eye bolts. When the shaft is being driven from a suitable source of power the friction at its various bearings tends to rotate the frame around the shaft axis; it is restored to its normal horizontal position by means of sliding weights, and the moment required to restore it to this position is a measure of the bearing friction.

The first set of bearings tested had been previously used and its surfaces probably were more regular than those with the usual stock finish. The nominal diameter of these bearings was 1.25 in. and their nominal length 1.25 in. The average clearance (difference of diameters) was about 0.0027 in., making the clearance-diameter ratio  $c/d$  about equal to  $1/450$ . The approximate composition of the babbitt-metal lining was 85 per cent tin, 7.5 per cent copper, and 7.5 per cent antimony.

The test shaft also had been used in previous investigations and it appeared to be quite highly polished at the journals. It was made of a high-carbon-tungsten tool steel, oil-quenched at 1550 deg. Fahr. and tempered 30 min. at 900 deg. Fahr., and had a Brinell hardness of about 350.

In a second test a new set of bearings of the same kind as the first set was used. These, however, were finished with a special type of commercial reamer which provided a smoother, more accurate bearing surface than the usual stock finish. The ends of the bearings were machined so that their length was  $1.250 \pm 0.001$  in. Their average diameter was 1.25098 in., the maximum variation in diameter being 0.00015 in. The measurements of diameter were made with a special type of commercial internal micrometer and were accurate to better than  $\pm 0.0001$  in. The average clearance was 0.00056 in., making the average clearance-diameter ratio about  $1/2250$ .

A new shaft was used for this test. It was made of a high-carbon-tungsten tool steel, its heat treatment being: heated at 1500 deg. Fahr., held for 30 min., quenched in oil, reheated

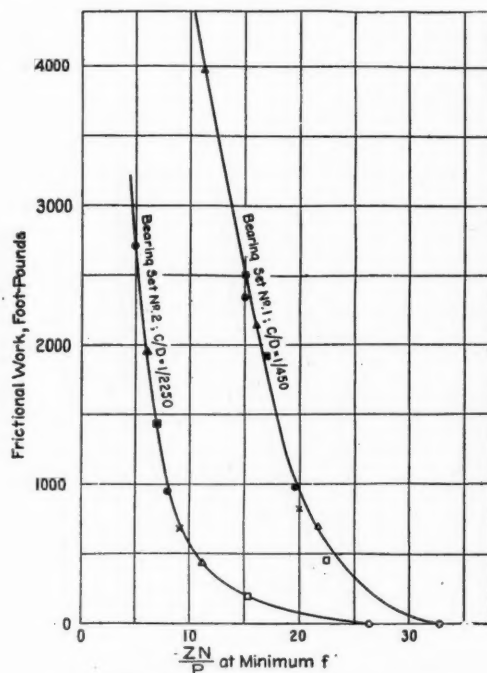


Fig. 1—Frictional work as a function of the minimum value of the friction coefficient



at 850 deg. Fahr. for 45 min., and air-cooled. It had a Brinell hardness of about 179. After treatment it was ground and lapped. The average diameter of the shaft at the journals was 1.25042 in., the maximum variation in diameter being 0.00017 in., these values being correct within  $\pm 0.00005$  in.

In testing the first set of bearings the lubricant used in most of the runs was a medium mineral motor oil having a viscosity of 293 sec. Saybolt Universal at 100 deg. Fahr. In the second, fourth and eighth runs, however, this was changed to a medium motor oil containing about 4 per cent of fatty oil, and having a viscosity of 279 sec. Saybolt Universal at 100 deg. Fahr. The average running temperature when using the mineral oil was about 80 deg. Fahr. and the absolute viscosity of the oil at this temperature was about 104 centipoises. The average temperature when using the blended oil was about 77.5 deg. Fahr., the absolute viscosity of this oil at that temperature being in the neighborhood of 107 centipoises.

The lubricant used throughout the second test was a mineral spindle oil having a viscosity of 126 deg. Saybolt Universal at 100 deg. Fahr. The average running temperature was about 73 deg. Fahr. and the absolute viscosity of the oil at this temperature was about 47 centipoises.

All results were plotted on coordinate diagrams with values of  $zn/p$  as abscissas and values of  $f$  as ordinates. Special plots on an enlarged scale were made of the lower values of  $zn/p$  and  $f$ . These latter plots show two distinct effects at the lower values of  $zn/p$ . The most conspicuous one is the progressive decrease in the value of  $zn/p$  at the point of minimum friction due to continued running-in. The other effect is the occurrence of a slight increase in the slope of the curves for the later runs at  $zn/p$  values just above the point of minimum friction.

#### Surfaces are Burnished

The decrease in the value of  $zn/p$  at the point of minimum friction with continued running-in may be explained by the burnishing action of the journal on the high spots of the bearings, causing a smoothing of the surfaces. There are two possible explanations for the slight increase in the slope of the curves for the later runs just above the point of minimum friction. One is that certain high spots on the bearings come in contact with the journals before the point of minimum friction is reached, and any smoothing at these points would tend to lower the friction at these values of  $zn/p$ . The other is that the burnishing action of the journals on the bearings has changed the over-all shape of the bearing surface to a slight extent. This would have an effect on the cross section of the oil film for any given value of  $zn/p$ , which in turn would affect the form of the curve.

Data taken during the tests permitted of calculating the frictional work done on the bearings in obtaining each point on all the curves. Following, for instance,

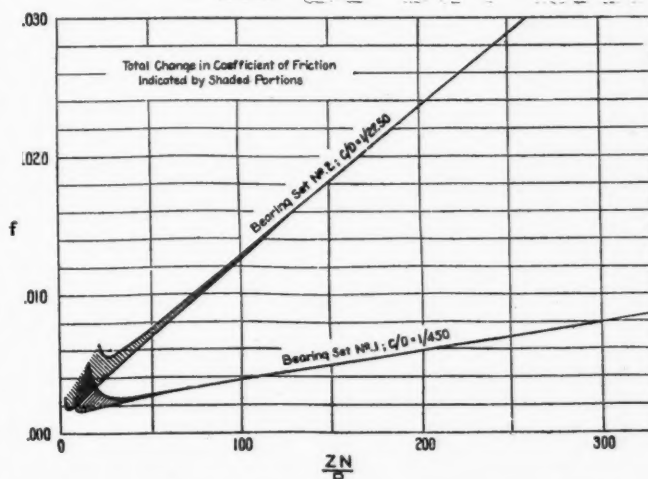


Fig. 2—Effect of clearance on friction coefficient

are data bearing on the frictional work done on the bearing in obtaining the last point of the eighth run of the test with the second set of bearings:

Coefficient of friction,  $f = 0.00265$ ; load, 300.2 lb.; therefore equivalent frictional force at surface of bearing  $= 0.00265 \times 300.2 = 0.795$  lb. Circumference of journal  $= 1.25 / 12 = 0.327$  ft.; duration of observation, 6 min.; revolutions per minute of journal 14.7; total number of revolutions during the observation  $= 6 \times 14.7 = 88.2$ ; total distance

traveled by surface of journal  $= 88.2 \times 0.327 = 28.8$  ft. Therefore the total frictional work done by journal  $= 28.8 \times 0.795 = 22.9$  ft.-lb.

In Fig. 1 the total frictional work per bearing, when operating in the region of unstable lubrication previous to each run, is plotted against the value of  $zn/p$  at the point of minimum friction.

#### Blended Oil Not Superior

From Fig. 1 it will be seen that the points representing the runs where the blend of mineral and fatty oils was used fall slightly to the left of the general trend of the curve. This is an indication that this lubricant exhibited the tendency that has been shown in other experiments to lower the value of  $zn/p$  at the point of minimum friction. The fact that the points representing the runs immediately following the runs where the blended oil was used fall back to the curve again, however, would seem to indicate that the blended oil did not show any strikingly increased efficiency in the running-in process over the straight mineral oil. It also shows that there was little if any tendency for the high oiliness factor to persist after the blended oil had been removed. The effect of a small amount of frictional work seems to far overshadow the effect of high oiliness of the lubricant except where the bearings are well run in.

One reason for testing the second set of bearings was to make sure that the effects shown by the first set did not result from the particular condition of the bearing surface or from the use of the blended oil. The performance of the second set was of the same general nature as that of the first set.

It is probable that the major reason for the difference between the values of  $zn/p$  at minimum friction for the first run with the two sets of bearings—32.5 and 26—is the difference in roughness of the bearing surfaces. Differences in the clearance diameter ratios and in the variations from true cylindrical surfaces probably have the most weight in causing the difference between the estimated values of  $zn/p$  at minimum friction for the well run-in condition (estimated at 6 and 3).

Fig. 2, in which are plotted the  $f$ -( $zn/p$ ) curves for the two sets of bearings, brings out the effect of the clearance-diameter ratio on the slope of the curves in the region of stable lubrication. It is of interest that the effect shown by these curves is not only in the same direction but also of about the same order of magnitude as is suggested by theoretical curves for bearings, which

are free from end leakage (Sommerfeld).

When a bearing is operating in the region where the value of  $zn/p$  is above the point of minimum friction, any increase in friction tends to raise the temperature of operation, which in turn lowers the viscosity of the lubricant with a resultant lowering of friction. Thus there is a tendency toward an equilibrium condition when the load and speed are steady, hence the name "region of stable lubrication." In that region the bearing operates in safety so long as the operating temperature is low enough to prevent flow of the bearing metal, too great a decrease in clearance due to expansion, or too rapid oxidation of the lubricant.

In the region where the value of  $zn/p$  is below the point of minimum friction, an increase in friction tends to raise the temperature. This lowers the viscosity of the lubricant as before, which, however, in this region, as indicated by the reversed slope of the curve, tends to increase the friction. Thus the effect is cumulative and eventually the bearing fails, hence the name "region of unstable lubrication." Therefore the value of  $zn/p$  at the point of minimum friction, since it is the boundary

between the two regions, becomes significant in determining the factor of safety under which a bearing is operating. Suppose, for example, a bearing were operating under stable conditions such that the value of  $zn/p$  was 100, and the value of  $zn/p$  at the point of minimum friction for this bearing was 20, the bearing would be operating with a factor of safety of  $100/20$  or 5, for the severity of operating conditions would have to increase in this ratio before the unstable condition was reached.

Thus running in, by reducing the value of  $zn/p$  at the point of minimum friction as is indicated in Fig. 1, tends to increase the factor of safety of a bearing when operating with a given load, a given speed, and a given lubricant.

Another result of the running in of bearings is that the frictional loss can be reduced without decreasing the factor of safety of the bearing, for if the critical point or point of minimum friction is lowered, evidently the bearing can be run at a point lower down on the curve of friction coefficients without increasing the risk of failure.

## Ricardo Discusses High Compression Engines

**H.** R. RICARDO, in a paper read recently before the British Institution of Petroleum Technologists, dealt first with the widespread fallacy that a high-compression engine runs at a higher temperature than one with a low compression. The reverse is the case, he said, because the mean temperature during the firing stroke is lowered very considerably owing to the longer expansion which takes place with a high compression.

The erroneous idea that a high-compression engine runs hot is probably due to two well-known phenomena, these being, first, that such engines are often hard on spark plugs, owing to the occurrence of detonation, and, secondly, that the high-compression engines of racing cars usually tend to burn out their exhaust valves. The reason for the second occurrence is simply that the racing engine runs almost continuously at full throttle, and also at three times the speed of a touring engine, so that, but for the safeguarding effect of the high compression, the exhaust valves would not survive even the first mile of all-out running.

Discussing the question of what compression ratio he would use, were a fuel available which would not produce detonation, Mr. Ricardo went on to point out that as the compression pressure is increased the efficiency rises, rapidly at first, but then more and more slowly, whereas the maximum pressure attained on the explosion stroke rises uniformly. Consequently, a point is soon reached at which the small gain in efficiency made possible by a further increase in compression is more than offset by the greatly increased loading and friction of the bearings caused by the high explosion pressure.

Suppose, for example, that an engine running with a ratio of 7 to 1 was altered to bring the ratio up to 8 to 1; this change would give an improvement in thermal efficiency of only  $4\frac{1}{2}$  per cent, while the maximum explosion pressure would be increased from 770 lb. per sq. in. to 930 lb. per sq. in.—a very big rise. Then, again, owing to this increased loading, the connecting rods and pistons would have to be strengthened, which would mean increasing their weight and so rais-

ing the inertia forces and bearing loads at high speeds.

The many experiments which Mr. Ricardo has carried out have led him to conclude that the following compression ratios would be most suitable were a fuel obtainable which would not produce detonation under any conditions:

Bore (in.)	2-2 $\frac{1}{2}$	2 $\frac{1}{2}$ -3	3-4	4-5 $\frac{1}{2}$
Ratio	8 to 1	7.5 to 1	7 to 1	6.5 to 1

In regard to combustion chamber design Mr. Ricardo said, that from the standpoint of detonation, the most efficient type of cylinder head which can be employed in practice (with poppet valves) is of conical or hemispherical shape, with the valves inclined and the spark plug practically central, as on nearly all racing-car engines; but, unfortunately, it involves the fitting of two overhead camshafts.

If it were desired to operate the inclined valves through rockers from a single camshaft, Mr. Ricardo recommended the use of two spark plugs carefully timed, one being placed on each side of the combustion chamber. The plug on the exhaust side should be given a lead of 3 or 4 deg. over that placed on the inlet side. The only disadvantage of this scheme was that if either plug failed the performance of the engine would fall off markedly.

Next there is the overhead-valve engine with the valve stems vertical, and, according to Mr. Ricardo, this widely used type does not give a very good performance when, as is usual, only one spark plug is employed. In fact, he claimed that as good, or even better, a result can be obtained with a side-valve engine, given a suitable form of turbulence head.

At the end of the paper Mr. Ricardo referred to some experiments made with sleeve-valve engines and pointed out that, size for size, these would withstand markedly higher compression pressures without detonation than any poppet-valve engine. This, he believed, was partly due to the fact that in a sleeve-valve engine there is no hot exhaust valve to heat the mixture locally and also because a compact and symmetrical combustion chamber with a central spark plug can be employed.



## Just Among Ourselves

### Community of Interest Between Companies

THERE are a number of folks in the industry who keep contending that despite the strenuous competition which everybody recognizes as a part of present automotive conditions, there is a real community of interest between different companies and different elements of the business in a broad sense. And as time goes on a multitude of informal happenings tend to bear out that idea even more strongly than any of the less frequent formal events. Executives of nearly every company, for example, are speculating or investing constantly in stocks and securities of rival companies. Their personal investments and market operations constantly show a far more accurate estimate of and an interest in the possibilities of other concerns than any public statements ever are likely to do. Sometimes these investments are very large, even when nothing more than a personal speculative angle is involved. Then too there come reports of occasional cooperative buying on the part of two or more smaller companies, even though those companies may be direct rivals in the retail market. All the way through, as time goes on, the favorable chances for cooperative action tend to outweigh further the possibilities of bitter competitive methods.

\* \* \*

### Pipes and Business

LOOKS like other companies will have to get up early in the morning if they want to get ahead of Marmon this year, at least so far as dealer meetings are concerned. H. H. Brooks,

Marmon's director of sales, had his Chicago dealer session at 8.30 a. m. this year and served breakfast instead of the usual luncheon or dinner. Theoretically the idea was to get the dealers before they got distracted with the thousand other things going on during the day, but President G. M. Williams, in opening his talk, gave what seemed to us as a far sounder reason; namely, that a good smoke is the best part of a meal and breakfast is the best meal after which to smoke. There's something friendly and comfortable about a dealer meal at which the president smokes a pipe. We only felt badly because we hadn't brought ours along. Mr. Williams seemed to enjoy his Prince Albert and probably likes Robert W. Service's poem called "The Black Dudeen." H. L. Purdy, vice-president in charge of production, we noticed was another Marmon pipe smoker but we're not sure of the brand of his tobacco. Some day it is our hope to make a complete investigation of Nicotine Fads and Fancies among Automotive Executives; naturally the pipe smokers will get the best break in any such compendium of useless information which we may assemble.

\* \* \*

### Idiosyncrasies of the Famous

ANOTHER survey which might bring together an equal amount of utterly useless and interesting data would be one about personal idiosyncrasies of various executives, particularly as they appear in public. One very famous man, well known to every automotive man but outside the industry, must always have a full dish of as-

sorted nuts before he begins his dinner. One car company executive, an unusually effective speaker, is utterly lost on the platform unless he has a pencil to juggle during his address, while another seems to do his most effective talking with a newspaper firmly clutched in his hand. Which reminds us of the musical farmer mentioned by the Happiness Boys at several automotive gatherings recently who not only plays the piano by ear, but also fiddles with his whiskers.

\* \* \*

### Hotel Show Exhibits Popular This Year

HOTEL show exhibits have played a larger role this year than they have for some time past. Some were inclined to blame these outside attractions for the falling off in attendance at the Chicago Show this year as compared to last. There is little question about the success of these hotel exhibits from the standpoint of the companies holding them, but, it is argued, the outside exhibits wouldn't be possible if it weren't for the big show itself. Consequently, in the minds of some, in fairness to all concerned the outside attractions should be curtailed sufficiently, at any rate, so that they will not seriously interfere with the attention given the Coliseum and Palace displays. Debate on this score is nearly as old as the shows themselves, of course, and probably will last long into the future. Since the whole question is largely one of degree and prominence of outside exhibits it seems reasonable to suppose that some arrangement will be made which will be fairly satisfactory to all concerned.—N.G.S.

# Teaching Truck Salesmen to Sell Along Vocational Lines

Plan suggested whereby manufacturers might collect a wealth of data on buying habits in various vocations and at same time kindle enthusiasm in sales staffs.

By A. W. Brownell

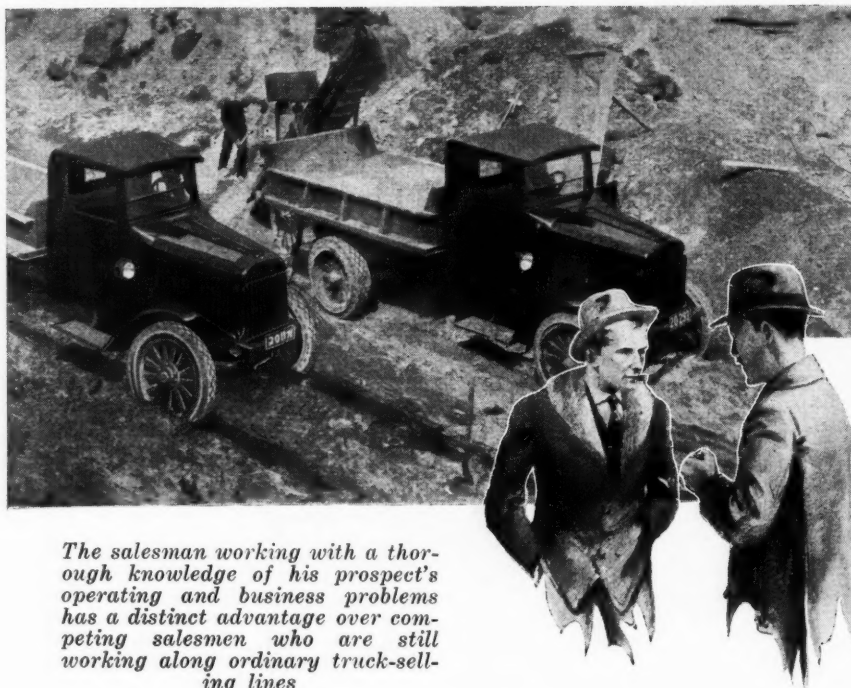
IT was with the thought that a new approach to the problem of intelligent selling along vocational lines by truck salesmen might be of interest to truck manufacturing executives that the plan outlined in this article was developed.

The manufacturers agree unanimously that trucks to be sold ideally should be sold along vocational lines. To accomplish this, however, it is imperative that each motor truck salesman study the business of his prospects—not only securing complete facts regarding their delivery problems, but also developing a rather thorough knowledge of the prospect's finances, competition and general business conditions.

The salesman working in this thorough fashion has a distinct advantage over competing salesmen who are still operating along ordinary truck-selling lines; that is, talking mostly from a mechanical construction and price standpoint. The vocational truck salesman soon has an intimate grasp of the prospect's business, and not only knows from his study when and why the prospect is in the market for new transportation units, but also knows exactly what size chassis and equipment to recommend.

Undoubtedly, if all motor truck salesmen sold along vocational lines—thoroughly knowing the prospect's delivery and business problems—the annual sale of motor trucks each year would show a substantial increase over the sales effected through present methods.

It is, however, one thing for motor truck manufacturers to agree that their salesmen should sell along



*The salesman working with a thorough knowledge of his prospect's operating and business problems has a distinct advantage over competing salesmen who are still working along ordinary truck-selling lines*

vocational lines, and quite another to get the salesmen actually to work this way. A few of the manufacturers have gone to great lengths in studying many of the more important vocations and have published considerable data for the benefit of the salesmen. These truck manufacturers have designated to their sales staff the time of the year when the various vocations have their business "peaks." In ad-

dition to this, they send out to each class of prospect—at the psychological time—very elaborate and forceful vocational literature and letters, as a background for the individual calls of the salesmen.

But in spite of the truck manufacturers' energetic attempts to interest and assist their salesmen in vocational selling, they have not been particularly successful; for the salesmen, even though temporarily stimulated, will soon fall back upon the old method of selling the mechanical and price features of their trucks.

A certain large truck manufacturer is planning to create additional vocational sales interest among his salesmen, through the medium of the motion picture, and is preparing some very interesting films to show in detail the use of trucks in certain vocations. It is questionable, however, whether even this very graphic and educational method will really secure permanently satisfactory results.

It is our belief that, to get the average motor truck salesman to develop vocational selling methods, the salesman himself must contribute—through his own efforts—a goodly portion of the vocational material to



be used. In short, if the salesman develops a certain amount of information, due to his personal activities, he will have an interest in and enthusiasm for the information and for vocational work, which he cannot get from other sources. If this is true (and from our personal acquaintance and experience with motor truck salesmen we believe that it is true) how can the truck manufacturer get his salesmen to collect the necessary information and really to work along vocational lines? Our answer is "Make them do it!"—and in this manner:

Suppose that the sales manager of a truck company issues an order to his branch managers and dealers that they are to get vocational reports from their salesmen within a period of 60 to 90 days from the issuance of the order. Each salesman is to investigate a particular vocation, study the delivery, finances, competition, and general business condition, write down the information and build it into the type of report considered best for his use, taking into consideration also the needs of the other salesmen, and submit the report to his manager on or before the 60 or 90-day date, the manager to keep a copy of each report and send the original to the factory. Here is the way we believe it would actually work out:

Let us assume, for instance, that a big city branch manager for a particular truck company receives such an order from his factory. He immediately calls in his metropolitan salesmen, explains in detail why such an order has come through, and why it will be of tremendous benefit to the salesmen to throw themselves into the spirit of the thing and give exactly what has been asked of them. Each salesman is given a different vocation. For instance, one takes grocery, another hardware, another oil, another department store, another coal and so on. Each salesman is instructed to call upon at least a dozen retailers and if possible a half dozen wholesalers, to read as much as possible on the subject and to ask questions of his fellow-salesmen—all pertaining to the vocation under view.

#### Calls for Little Time

The salesmen are instructed to make their vocational investigations with a minimum amount of time taken from their regular routine calls. Naturally, they cannot keep up to their usual number of contacts during this investigation period, nor should the sales manager expect this. However, it has been our observation with similar investigations conducted in other fields of selling, that the salesmen can handle the situation so that only a relatively small amount of time need be charged off to this research work.

Let us take, as a hypothetical case, Bill Jones who has been assigned the grocery vocation. He calls on 12 or 15 grocery retailers, some of whom are in his territory, and some of whom are outside. He also makes it a point to see five or six wholesale grocery concerns. In addition, he writes to the business managers of several leading grocery trade papers, asking for any data they may have regarding their market, particularly pertaining to delivery and trucking problems. He also confers with the other salesmen in his organization who have had experience with grocers, as well as a few friendly competing truck salesmen. In addition he includes an interview with the secretary of the local motor truck club.

As the investigation goes on, Jones is surprised to find that in an astonishingly short time he has collected a tremendous amount of important information regarding the grocery business. He suddenly realizes that he has always had this information right at his elbow, yet had never taken advantage of it. And gradually

he gets into the spirit of the investigation and before the report is completed he is very enthusiastic and very much convinced that he is now splendidly equipped to sell, to the grocery field, an increased number of trucks over any record he has been able to establish in the past.

Bill Jones' report on the grocery vocation is now given to his branch manager, who keeps a copy of it, and sends the original to the sales manager at the truck factory. In addition to Bill Jones' report on the grocery field, there are many other grocery reports coming in from salesmen from other sections of the country, as well as a large number of reports on hardware, oil, department stores, lumber and other lines.

#### Reports Published

The truck sales manager now has before him more detailed and complete vocational truck selling information than any truck sales manager has ever had in the history of the motor truck industry. The sales manager, together with his assistants, segregates the reports by vocations, breaks them down and then writes a series of composite vocational reports. These are published in pamphlet form—one for each of the many lines covered. These, in turn, are sent to the entire sales organization, so that Bill Jones not only receives (in printed form) the information he collected, but also has the benefit of the additional facts developed from the grocery reports of his colleagues as well as similar data regarding all the other important vocations.

Bill Jones is now fully prepared to do the best job in the grocery classification he has ever done. He also knows exactly how to go about completing his information for the other vocations. For instance, before he makes his next call on a hardware dealer, he will study the hardware reports made by the other men. This will give him about 75 per cent of the information required, and he will get the balance from the hardware prospects in his own territory through personally interviewing them and asking them practically the same questions as those asked while making his grocery investigation.

In summarizing, it seems as if both the salesmen and the executives at the factory would greatly benefit from such a vocational investigation on the part of the sales representatives.

Supposing, for instance, a truck manufacturer has 500 branches and dealers, and that these various sales headquarters average three truck salesmen apiece. This would make 1500 vocational reports, and the work could be so assigned that every important (or semi-important) vocation would have, as a minimum, at least 12 to 24 reports—with many of the vocations being covered by infinitely more reports than this.

#### Permanent Vocational Attitude

It would indeed be a sluggish salesman who did not respond to the vocational method of selling after making his own personal investigation along the lines suggested above, and in addition reading over the valuable facts developed by others in all parts of the country.

It seems safe to assume that such an investigation, conducted through the sales organization, would not only be decidedly effective in stimulating the salesmen, but would also tend to develop a permanent vocational attitude toward their sales problems and in addition give the factory more vocational information than any truck manufacturer has ever had at his disposal. Another satisfactory element is the fact that the investigation could be completed at a very small cost to the manufacturer and with practically no loss of time or money to the salesmen themselves.

# NEW DEVELOPMENTS—Automotive

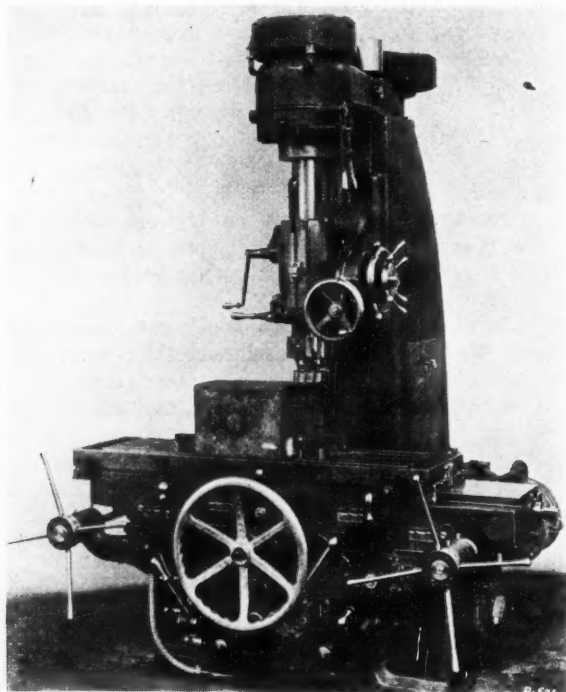
## Reed-Prentice Miller

**R**EED-PRENTICE CORP., Worcester, Mass., has announced Model No. 5 vertical milling and die sinking machine for heavy duty vertical milling of large castings and for machining drop forgings, body dies, etc.

Features of this new machine include high spindle speeds obtained through belt drive to spindle; rapid power traverse in both directions for longitudinal and cross feeds; Timken roller bearings used throughout; wide range of feeds and speeds; centralized control; micrometer stop gage on spindle for controlling depth of cut.

The saddle extends the full length of the table and has four bearing surfaces. All feed and speed gears are of heat-treated alloy steel and run in oil. The main drive pulley is supplied with a clutch and brake, and starting and stopping are controlled through one lever located at the front of the machine.

Longitudinal and cross feed screws are of heat-treated, chrome-molybdenum steel of 50 Shore hardness, with the screw threads finished by lapping and with nuts of alloy phosphor bronze. The heat-treated forged nickel-chromium steel spindle is supplied with

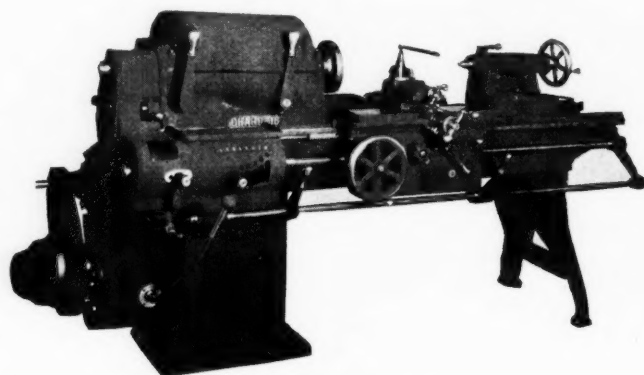


*New Reed-Prentice vertical milling and die sinking machine*

a clutch-type nose and the standard N.M.T.B.A. taper hole.

Brief specifications of the machine are: Working surface and overall size of table 62 by 16 in.; table travel, longitudinal 48 in., cross 16 in.; vertical feed of spindle 9 in.; travel of head on column 15 in.; number of spindle speeds 18; range 16.9 to 600 r.p.m.;

number of feeds for each spindle speed 8; range cross either direction 100 in. per min., longitudinal either direction 100 in. per min.; floor space 110 in. wide by 95 in. deep by 98 in. high.



*Chard multi-speed lathe*

## Multi-Speed Lathe

**C**HARD LATHE CO., New Castle, Ind., has developed a multi-speed lathe in which the four highest speeds are transmitted direct to the spindle without passing through any gears in the headstock. A four-speed gearbox is cast integral with the lathe leg. The motor bracket is on top of the gearbox, connection being made by silent chain. From gearbox to spindle drive is by belt.

No parts are mounted on the headstock, lowering headroom required and eliminating much vibration. Three speed changes are provided in the headstock to furnish 12 spindle speeds. Forward speeds are obtained through a friction clutch operated by levers at the front of the lathe. All other speeds are obtained through sliding gears.

The spindle and back shaft are hollow to make constant oiling of all moving parts possible.

## Gear-Tooth Burnisher

**T**HE Fellows Gear Shaper Co., Springfield, Vt., has recently developed a gear-tooth burnishing machine by means of which the working surfaces of gears are smoothed and slightly condensed so as to offer less frictional resistance as opposing teeth pass through contact.

The machine comprises a base and a bed, the latter carrying the principal working units. Three burnisher gears are employed, one being power-driven, the second being free to rotate and the third arranged so that pressure can be applied through it to the gear being burnished. The amount of pressure to be applied varies with the pitch, diameter and face width of the gear being burnished and adjustments are possible for different pressures by means of a fulcrumed arm and removable weights.



# Parts, Accessories and Production Tools

## New Oxweld Products

**T**WO new products have recently been developed by the Oxweld Acetylene Co., New York—a cutting blowpipe which will not backfire and a large wheel truck for transporting oxy-acetylene equipment.

The new blowpipe, designated Type C-14, uses the same nozzles as the Oxweld Type C-2, which it resem-



*New Oxweld C-14 cutting blowpipe*

bles. The three gas tubes are straight. The small needle valve bodies and the head and rear bodies are made of pressure forgings instead of castings to give increased durability with decreased weight. Interchangeable nozzles are provided for using medium or low pressure acetylene.

The new truck is featured by its large wheels which make it easier to handle. They are of steel, 24 in. in diameter, and are fitted with 3 by  $\frac{3}{8}$  in. grooved tires and a cast-iron hub. The hub is bored to fit the cold-rolled steel axle and a grease cup is provided.

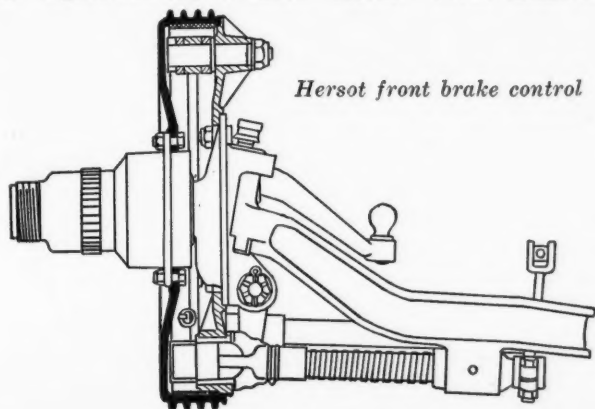
The handle is continuous and is bent back so that the truck can be easily handled by an operator of small stature. By changing the position of the axle to the lower set of holes drilled in the frame, 14 in. diameter wheels can be used instead of the larger size.



*Oxy-acetylene truck with 24-in. wheels*

## Bendix Acquires Hersot Brake

**B**ENDIX BRAKE CO. has taken over the American rights for the so-called "Hersot" front brake con-



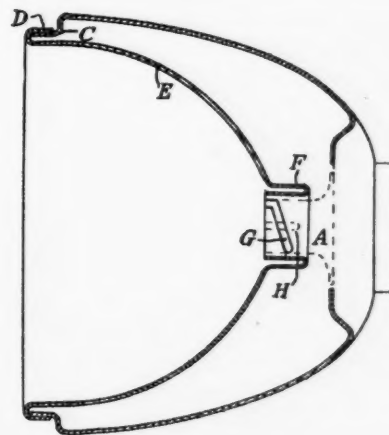
*Hersot front brake control*

trol. This control is said to have been in use for some time on axles produced by the Lemoine Co. of Paris, and to be well-known abroad, but it has not been used in the United States.

In this control, a flexible shaft of helically-wound spring material, ordinarily mounted on the axle, is used in applying the brake.

## Headlight Focusing

**A**NEW focusing arrangement for headlamps has been patented in England by the British Thomson-Houston Co. The bulb holder is rigidly secured to the casing at A and the front end of the casing is provided with an annular rim C. The outer end D of the reflector E is bent over so as to make contact with the outer rim C, which forms a seat on which the reflector can rotate. The inner end F of the reflector is bent so as to form an annulus of U-shaped section, the inner ring of which is provided with diagonal slots G adapted to surround the outer end of the bulb-holder A, which has corresponding axial slots H. The bulb is secured in position by revolving the reflector until the inlets to the diagonal and axial slots coincide and then pressing the projections on the bulb into the slots, the pressure being maintained until the reflector has been ro-



*Thomson-Houston method of focusing headlamp bulbs*

tated sufficiently to trap the bulb. The focusing operation is then carried out by further rotation of the reflector in a direction which effects an axial displacement of the bulb.

**I**N the process of manufacturing butyl alcohol and acetone by the fermentation of corn, two American factories alone consume 25,000 bushels of corn a day. The result is the liberation of a mixture of hydrogen and carbon dioxide at the rate of 114,000 cu. ft. a minute, and many experiments have been made to find a means of its utilization. It is now reported that at Peoria, Illinois, a process has been developed for converting the gases into methyl alcohol, of which as much as 4500 gallons are obtained daily. The process is one of catalytic pressure hydrogenation of the carbon dioxide.

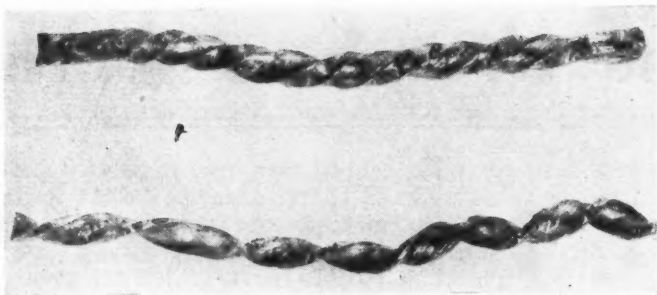


Fig. 1. Plate welds twisted through 1080 degrees to show the ductility of electronic tornado welds

## Electronic Welding

**D**EVELOPMENT of the Electronic Tornado welding method has brought notable gains in uniformity of structure and ductility of welds as well as lower costs, according to the Lincoln Electric Co., Cleveland, Ohio. The company states that the cost of welding  $\frac{1}{2}$  in. plates, including operator's time, electric current and carbon electrode will not exceed 3 cents per running foot of weld and that the cost of welding plate of other thicknesses will be in proportion.

Metal deposited by usual welding methods has the characteristics of cast steel. By this new process it is said that the metal deposited has equal or even better physical characteristics than the metal of the plates being joined by welding. This results from the purifying effect of the electronic tornado.

Fig. 1 shows test pieces containing electronic tornado welds in  $\frac{1}{4}$  and  $\frac{1}{2}$  in. plate. The welds were sawed from the plate and were twisted through 1080 deg., or three complete revolutions, without showing any indication of failure.

Fig. 2 shows welds on heavy plates which have been

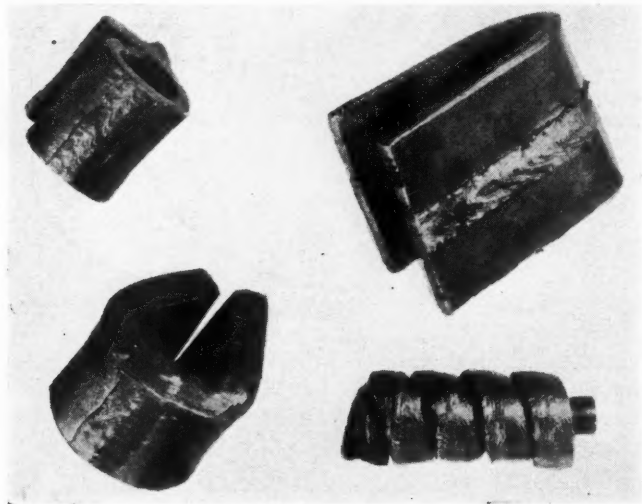


Fig. 2. Other tests of ductility and tensile strength of electronic tornado welds made on heavy material

subjected to unusually severe bending and twisting tests. These indicate that there is no impairment in the strength of the parent metal by the new welding process and that the weld is quite as strong as the parent metal.

Another advantage claimed for the new process is the smoother finish which is obtained on the welding bead. This is thought to be caused in part by the higher speed of travel of the welding head.

## New Size Mil-Waukee-Mil

**K**EARNEY & TRECKER, Milwaukee, has announced that the Mil-Waukee-Mil production milling machine introduced at the last Machine Tool Builders Exposition and described at length in *Automotive Industries* for Sept. 17, 1927, is now being made in two sizes designated as the 1400 and 2200 series. The Series 1400 is like the original machine with a 14-in. wide table built in either Simplex or Duplex type.

The 2200 series is a new machine having a wider and heavier bed equipped with a 22 in. wide table in Simplex and Duplex types. The operating features of both series are identical and the same unit plan of construction is employed whereby any model may be equipped with standard units to accommodate the particular productive requirements of the user.

Each of the series, and all models, are offered with a table range of 3 ft., 4 ft., 5 ft., 7 ft., 9 ft., or 11 ft., giving a total of 24 models to choose from.

## Light Truck Wheel

**D**AYTON STEEL FOUNDRY has recently developed a steel spoke wheel for light trucks. It has the typical Dayton hollow arch spoke construction, integral hub and felloe. It is cast in one piece from



Dayton light truck wheel

electric furnace steel and is machined at one set-up, thus assuring concentricity of bearing bores, brake drum pilot and tread.

**A**CCORDING to *Engineering* of London, five long-distance flights promoted by British interests were under way during the month of December. Capt. R. H. McIntosh and Mr. Hinkler were making a journey from England to India on a Fokker machine driven by a British Bristol engine, though they were not successful in doing this without a stop. A group of four R.A.F. flying boats under Group-Captain A. M. Cave-Browne-Cave and an Avro with Capt. Lancaster and Mrs. Keith Miller on board were all bound for Australia. Two R.A.F. Fairey biplanes were on their way from Cairo to Nigeria, and Sir Alan Cobham, accompanied by Capt. H. V. Worrall, had begun his survey tour of 20,000 miles through and around Africa. The first of these flights, though it failed to beat Chamberlin's long-distance flight from New York to Eisleben, Germany, was expected to help in the establishment of an air route between England and India.



# "Day of the Curbstone Dealer is Past"

*Retail organization of today must be built of first-class business men, says one factory executive.*

THE day of the curbstone dealer is past. A passenger car company today has got to build its future on a retail organization of stable, sound business men if it is to stay in the picture and make money. The curbstone dealer in most cases has turned out to be more trouble than he is worth to the factory."

The man expressing this opinion was a factory executive who has had as much experience with curbstone dealers as anybody in the business. He still is having experience with them as a matter of fact. That's why he happened to make the remark.

Every factory official, obviously, does not agree with this thought, as is evidenced by the sales plans still being developed in some instances. It is interesting to note, however, that several companies which, a few years ago were adding an ever increasing number of dealers within relatively small urban areas, today are either cutting off some of those of the curbstone type or are letting them die a natural death. The purpose and result of this policy, of course, is to give the real, sound dealer a better chance to make a reasonable profit on his investment.

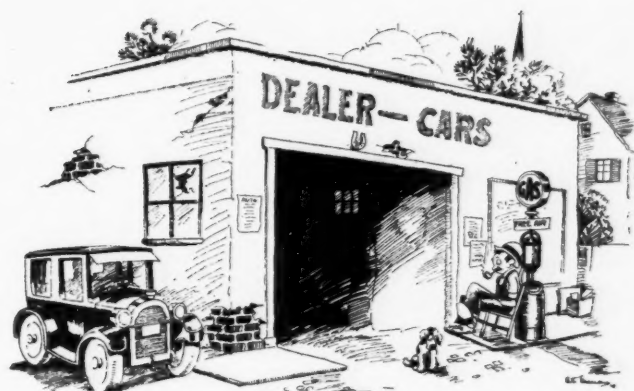
At the same time a number of companies are making definite drives for greater dealer representation in general and undoubtedly must continue to broaden their distributing outlets if they are to meet competition successfully.

Are these two tendencies contradictory? Must one policy or the other be wrong? Or are there special conditions surrounding each one which make both sound?

These questions have been raised by several people in recent weeks and consequently seem worth discussion with a view to clarification. And the process of analysis need not go very far before it becomes evident that there is nothing contradictory in the two policies.

In certain city territories, experience has shown almost certainly that there have been too many dealers for given makes of cars; too many, that is, to permit reasonable profit on operations by the really stable and well financed merchants involved. Study of the distribution set-up of almost any passenger car company today, on the other hand, will reveal many territories in the country where that company either has no representation at all or where it is inadequately represented.

Both of these conditions now seem to be more clearly recognized by most factory sales departments than they ever have been in the past. The result is that a number of companies are starting in their 1928 marketing campaigns by making the most strenuous kind of effort to bolster up and extend their dealer representation in areas where now they are weak. At the same time, moves are being made, sometimes by the same com-



panies, to adjust more equitably sales outlets in large cities so that each retailer has a real chance to make money.

The whole factory handling of distribution problems today, as a matter of fact, seems to be getting more and more out of the realm of abstract theory and into the practical facts of existing conditions. Talk to factory men about the old distributor vs. branch question, for example. No more does one hear much high-flown conversation about the fundamental economics of this and that, or the functional responsibilities of the participating factors. Far from it. Factory executives interrogated now tend strongly to talk in quite practical terms. The following rather typical expression, for instance, came the other day from an executive of a company which has employed both distributors and branches for a number of years:

"We're not trying to eliminate distributors," he said. "We are glad to have hard-working wholesalers who really will function as distributors. That means actually getting dealer representation at all necessary points; covering the territory adequately with traveling men; helping dealers and educating dealers in a consistent, practical way; carrying adequate stocks of cars, and in general doing a modern, competitive merchandising job.

"The battle is too keen today, though, for us to be able to get by with any distributor in any important territory who is resting on his oars in the slightest degree or who is in any way failing to put behind our line a vital, moving effort every day in the week.

"Branches are no pet theory with us. They became practical necessities in some instances and that's why we have them. When we can get the business through distributors we're for distributors."

And so throughout many other aspects of the selling problem. There is a stronger disposition than ever to accumulate actual facts and detailed evidence regarding conditions and performances. Then, the tendency is to meet the problems developed by study of that accumulated evidence on the basis of very practical marketing needs, rather than to let any preconceived theories hinder in any way getting the best job done in the most efficient way possible.—N. G. S.

# Crankshaft *Bearing* Caps Machined *in* Complete Sets

*Continental method eliminates inventory control for individual or half caps and insures that each set will be finished in the proper dimensional relationships.*

By K. W. Stillman

CONTINENTAL MOTORS CORP. has developed a very interesting production line-up for the manufacture of the crankshaft bearing caps for one of their motors. The engine is a six-cylinder, seven-bearing job and the bearing cap production has been so arranged that an entire set of caps goes down the line at once.

There are 11 machine operations performed on each cap and in all but three, which are performed on Avey single spindle drills, the machines and fixtures are arranged so that all seven caps—14 pieces—are operated on at once.

The first operation is to mill the cylinder contacts of the caps, which is done in a 42-in. Ingersoll rotary milling machine as shown in Fig. 1. The rotary work table contains work holding fixtures to carry two complete sets of caps, the two halves of each cap being fastened together in one fixture.

As shown in the illustration, the machine is fitted with two cutters, one of which takes a roughing cut

while the second finish mills the surfaces. The operator loads and unloads the machine and sets the milled caps in containers where the sets are kept segregated.

The next operation is to drill the bolt holes in the caps which is performed in a 30-spindle, multiple drill press as shown in Fig. 2. Here again, the rotary work table carries work holding fixtures for two complete sets of caps—one set being unloaded and another set loaded into the fixtures during the drilling operation.

Following this drilling operation the bolt holes are spotfaced on a 21-in. Cincinnati drill press which is also equipped with rotary work holding tables and fixtures so that a complete set of caps can be operated on at once.

In the next operation the caps are placed in an Ingersoll drum type milling machine, shown in Fig. 3, where the sides of the cap are straddle milled. In this operation, also, complete sets of caps are machined at once, the time required for milling being just long enough for the operator to unload a finished set and load an-



Fig. 1. The 42-in. Ingersoll rotary mill used to rough and finish mill complete sets of bearing caps

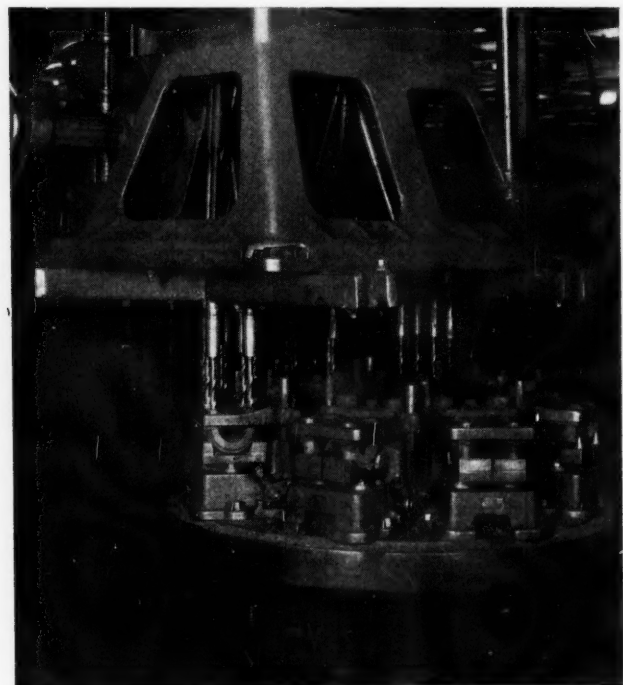


Fig. 2. A 30-spindle multiple drill press used to drill all bolt holes in a complete set of bearing caps.



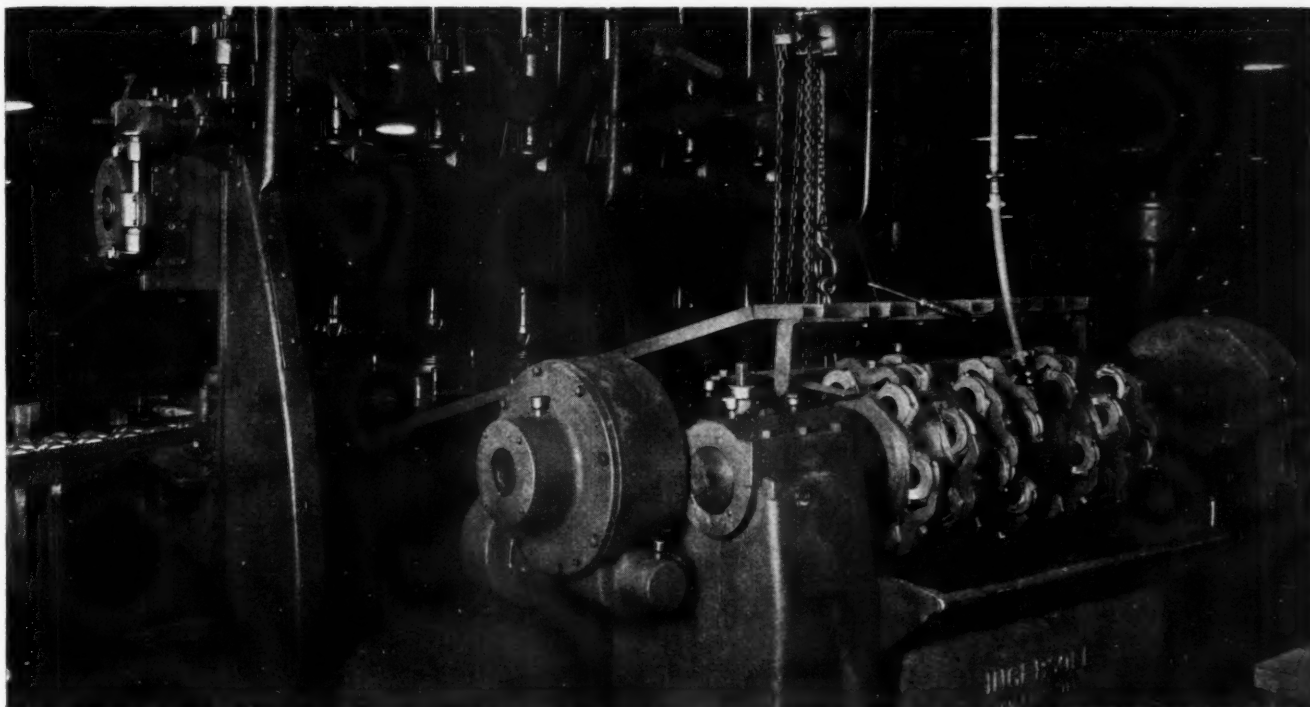


Fig. 3. Sides of bearing caps are straddle-milled in this Ingersoll drum type milling machine, several complete sets being operated on at once. Machining is continuous

other as the drum rotates past him. Finished caps are placed in the troughed slides directly above each cap, down which they slide to a seven-spindle Foote-Burt drill where the bearing holes are rough bored and chamfered.

Use of these slides not only prevents any mixup of caps but permits the operator of the drill press to select unbored caps to place under each spindle without any hesitation as to which are the proper ones, since the milled bearings slide down directly behind the proper boring spindle.

Directly behind the drill press may be seen a small roller conveyor which leads to an 18-in. Cincinnati automatic milling machine where the caps are milled to length. The roller conveyor is divided into several longitudinal sections which separate the various caps according to their length.

After being milled to length, the rear bearing cap has its filler block clearance milled on a 12-in. Cincinnati miller and then follow small drilling operations, which are performed on single spindle Avey drills, and final inspection.

The method of working on complete sets has been found to be very satisfactory because it not only eliminates inventory control for individual caps or half caps but it also insures that each set will be finished in the proper dimensional relationships since all pieces pass through the machines almost simultaneously.

## Diamond Six-Cylinder Trucks

FIVE NEW six-cylinder models have been added to the line of trucks built by the Diamond T Motor Car Co., as follows:

Model T36—1½ to 2-ton, solid tires, 3¾ by 4⅞ in. engine, 25 m.p.h.

Model U46—2½-ton, solid tires, 4 by 4¾ in. engine, 21 m.p.h.

Model U56—like U46 but with radius rods.

Model T46—1½ to 2-ton, pneumatic tires, 3¾ by 4¾ in. engine, 35 m.p.h.

Model U66—2½-ton, dual pneumatic tires, seven-speed transmission, 4⅞ by 4¾ in. engine, 40 m.p.h.

Models T36 and T46 and U46 and U56 are essentially the same with the same general design of engine with many interchangeable parts used. The 3-in. crankshafts rotate in seven bearings in each engine.

The one-piece blocks have two removable cylinder heads. Centrifugal pumps force water from the radiator directly around the valve seats and stems. Oil filters are built in and work in conjunction with large oil pumps. Each main bearing supplies oil to but one connecting rod. Air cleaners are standard equipment.

Piston pins are made of molybdenum steel. Zenith carburetors with Swan manifolds are employed. With the exception of Model U66, fuel tanks of 33-gal. capacity are located under the seat.

Multiple-disk, dry-plate clutches, Raybestos-lined, are employed. In Models T36 and T46 three-speed transmissions are mounted in unit with the engine. Four-speed transmissions mounted amidships are employed on Models U46 and U56. The U66 transmission is mounted amidships and provides seven speeds.

Two metal universal joints are employed in the unit powerplant assemblies and flexible joints are used between clutch and transmission and slip joint metal universal between transmission and rear axles in the other models.

Final drive on the T36 is a worm drive, semi-floating type Timken; on T46 a Timken spiral bevel gear drive is used; on Models U46 and U56 a full floating worm drive is standard while on Model U66 a full floating worm with 5 2/5 to 1 ratio is employed.

Semi-elliptic springs are standard, dimensions varying with different models and all leaves are of chrome vanadium steel. Shackles are provided in front and hangers in rear of front springs.

Duplex internal service and emergency brakes on the rear wheels are standard.

# France Pushing Efforts to Develop Synthetic Motor Fuel

Various agencies cooperating in extensive research program looking to discovery of cheap and efficient substitutes for gasoline. Progress traced in recent report.

PROBABLY more study has been given in France to the development of substitute and synthetic fuels than anywhere else, in pursuance of a national policy of securing independence of foreign sources of fuel supply. While the search so far has not been particularly successful, a quantity of valuable data has been amassed, much preliminary work has been successfully completed and the program is being vigorously followed up, with the assistance of a number of private and public agencies working with the National Liquid Fuels Office.

The extensiveness of the French research is clearly indicative of the difficulties encountered in the solution of the problem of obtaining a cheap and efficient substitute for gasoline. An interesting review of the various measures taken by the French government along these lines is made by Louis Pineau, director of the National Office, in a recent lengthy report published by the commercial vehicle paper *Le Poids Lourd*.

## Study of Combustion

One of the studies undertaken concerns the phenomena of combustion and the physico-chemical properties of petroleum derivatives. This has been undertaken by the National Office under the direction of Chief Engineer Dumanois, but much of the work has been entrusted to staff members of the Physical and Chemical Laboratory of the University of Paris who have long specialized in such matters.

The Laboratory of the School of Petroleum Technology of Strasbourg, on its part, undertook an investigation of the limits of inflammability of ethyl and methyl alcohol solutions and of the combustion of such solutions. The Strasbourg laboratory also has undertaken researches on lubricating oils. Finally, the National Office attacked the problem of the replacement of castor oil, an expensive lubricant which is imported chiefly from British India, by oil extracted in France from grape pits. These experiments not having yielded the hope-for results, the National Office decided to develop the production of castor oil and to reconsider the question of raising the castor bean in French colonies.

There has been much talk in France concerning the so-called national fuel, the *carburant national*. Some of the steps taken by the government to force a particular fuel, partly of native origin, upon the French motoring public, have not been very happy in their results and are glossed over in M. Pineau's report: The problem of substitute fuels, he says, has entered a new phase during the past two years and it is becoming more and more evident that there will be no single solution to the national fuels problem; any solution of

the problem put forward is of interest from one point of view or another, and deserves careful study. The Scientific Committee on Petroleum has delved deeply into two partial solutions, viz.: ethyl alcohol and wood charcoal.

The use of ethyl alcohol as motor fuel has been studied since 1923, under the presidency of the late Daniel Berthelot, by the Scientific Committee on National Fuels. The latter established the fact that mixtures of 50 per cent absolute alcohol and 50 per cent gasoline can be used in conventional engines without causing any abnormal wear of parts. The mixture even has certain advantages over pure gasoline; the engine runs more smoothly, higher speeds can be maintained on hills, and the thermal efficiency is somewhat higher.

The only obstacle to the general utilization of the national fuel hereafter resides in the small tonnage of alcohol available for denaturation, which did not exceed 23,000 tons in 1926. The law of Feb. 28, 1923, helped the alcohol producers but, unfortunately, it did not contribute materially to the supply of liquid fuel required in France. The price of beet alcohol, which is fixed by law on a parity with that of cane sugar alcohol, making competition with gasoline impossible, it became necessary to stretch the beet alcohol with alcohol from other sources which is more plentiful and cheaper, such as cellulose alcohol, synthetic alcohol and colonial alcohol. It is in this direction that the efforts of the National Liquid Fuels Office and of the Scientific Committee have been directed.

## Cellulose Alcohol

Grants have been made to stimulate the production of cellulose alcohol (ethyl alcohol made from wood refuse), and the laboratory results with this process have given rise to the hope that commercial success may be achieved in the near future. In this connection M. Pineau sounds a warning. He points out that the launching of a new industry always calls for heavy outlays of capital and involves risks which no one cares to take unless the rewards in prospect are sufficiently enticing. He voices the hope that the regulatory obligation of blending beet alcohol with alcohol from other sources will not have the effect of depressing the price of cellulose alcohol too much, at least not during the formative state of the cellulose alcohol industry.

Another possibility that has been given due consideration is the production of alcohol from tropical plants in French colonies. The leaves of the sisal agave, the fibers of which are used in the textile industry, furnish appreciable quantities of fermentable sugars. A mission was sent to Algiers in 1926 to study the conditions



of cultivation of sisal and the possible alcohol yield of its leaves. Another mission was sent to Senegal in 1927, where it carried on experiments on a semi-industrial scale in the production of alcohol from a sisal base. The first results obtained permit the hope that it will be possible to derive alcohol from this source as a by-product at a comparatively low price. However, it is more than likely that all the alcohol which can be produced from this source in the colonies will be required to meet the demands of the local markets, as in most of the French colonies gasoline has reached almost prohibitive prices.

Numerous demonstrations and competitions which have been held during the past several years have shown the possibility of using wood charcoal for the generation of producer gas which can be used in truck engines. The problem of purification of the gas has been solved in a satisfactory manner, and there is no danger of injury to the engine by corrosion or incrustation. The loss in power due to the lower caloric value of the gas has been made up in part by the use of higher compression. It is also advisable to use engines of a slightly larger bore. The saving which may be realized by the use of wood charcoal as compared with gasoline is not yet very important, in spite of the reduction in taxes voted on June 30, 1926, for vehicles equipped with gas generators. The use of gas-generator trucks will be considerably more attractive now that the army has started paying a subsidy on them. Much work is now being done on processes of producing balls or cubes of charcoal or semi-coke with a bituminous binder, and the hope is expressed that this will result in an attractively low price for this basic motor fuel.

#### The Gas Generator Problem

The solution of the problem of a gas generator for heavy vehicles is of particular interest to the French army. Experts have held that 800,000 tons of charcoal for gas generators could be produced each year in the French forests, on top of the 275,000 tons now being produced for other purposes. Most of this charcoal would not be produced in wood distilling or carbonization plants; with the appearance of synthetic wood alcohol (methanol) the installation of new plants of this type would not be warranted; a more practical plan would be to perform the carbonization in portable ovens directly in the forests, and the National Liquid Fuels Office, in collaboration with other government departments and private organizations, has conducted a number of competitions for portable charcoal ovens for use in the forests. M. Pineau assures us that these competitions have yielded valuable information and have led to the development of an oven which is readily portable and has a very satisfactory yield of charcoal.

Efforts have been made also to derive liquid fuels from mineral fuels. The Carbonization Committee, which was organized within the Gasoline Control Board as early as 1922, has devoted a large part of its activity to the solution of this problem. It issued rather pessimistic views with regard to the use of peat; but now that there is a possibility that semi-coke of peat may be used in gas generators of motor trucks, the conclusions drawn will probably have to be modified.

The National Liquid Fuels Office also made a survey of French lignite deposits, the exploitation of which is still in its beginnings. The study of the yield on distillation of various French lignite samples led to the conclusion that the extraction of liquid fuels from lignite by carbonization, aside from various mechanical difficulties to be overcome, is dependent upon the possi-

bility of utilizing the lignite coke industrially.

As regards the industry of bituminous shales, this was greatly encouraged by the repeal of the excise tax on shale products by the law of April 4, 1926.

Various measures have been carried through by the Carbonization Commission to increase the home production of liquid fuels. It has been made compulsory for all gas works to extract the benzol from their gas, which latter amounts to more than two million cubic meters per year. Instructions have been given to prefects concerning the enforcement of anti-smoke ordinances in built-up districts, which is evidently intended to discourage the use of raw coal and encourage that of coke. Moreover, all public administrations have been instructed to use coke in preference to anthracite or bituminous.

#### Research Company Formed

The Gasoline Control Board in 1924 took the initiative in the formation of the National Company for Research on the Treatment of Fuels. This company, one-half of whose shares and several seats on whose board are held by the National Liquid Fuels Office, was created in collaboration with industrialists for research work in connection with fuels. A modernly equipped laboratory has been installed at Villers-St. Paul near Creil. The company is engaged in the scientific development of the catalytic transformation of gases obtained from coal. It has been found that a very large number of solid bodies may bring about different reactions between these gases according to a mechanism the operation of which is as yet obscure. The laboratory is actively engaged in studying systematically these complex phenomena, and is endeavoring to formulate the laws which control them, with a view to basing a rational program of research work thereon.

From a practical point of view, the results obtained by the laboratory concern primarily the development of a process for the synthetic preparation of methyl alcohol (wood alcohol). A semi-industrial installation for the experimental application of this process is under way near Lens. The possibilities of methanol as a motor fuel are known. This fuel even has some advantages over gasoline. It only remains to determine whether its cost of production is low enough to enable it to compete with gasoline.

This is a question on which the Lens installation is expected to give precise results. Other work has been done by the Laboratory of Villers-St. Paul, the results of which, paralleling those of several chemical and coal companies with the hydrogenation and catalytic treatment of coal gas, encourage the hope that synthetic fuels will materially contribute to France's supply of liquid fuels.

One of the problems assigned to the National Liquid Fuels Office being to reduce the country's need for petroleum imports, the office looked into the possibilities of electric vehicles. Various competitions that have been held have shown that these vehicles are well adapted for an economical and reliable city delivery service. In order to encourage the use of these vehicles the National Office is now considering the extension of its tax-exemption scheme to cover these vehicles as well as generator-gas trucks.

**M**OTORCYCLE exports from Great Britain are gaining rapidly, while the imports are dwindling. During 1926 about 120,000 machines were manufactured in Great Britain, of which 16,130 were exported. During the first six months of 1927 the exports had risen to 32,012.

# AUTOMOTIVE **NEWS SECTION** INDUSTRIES

Philadelphia, Pennsylvania February 11, 1928

## Output Levels Exceed 1927 Responding to Show Buying

PHILADELPHIA, Feb. 11—Generally heavy schedules by manufacturers who exhibited new cars at the shows are holding the total output for the automotive industry to levels slightly larger than those at this time last year. High sales totals were recorded at many of the shows and there is a considerable movement of cars into owners' hands. In view of the good retail condition, factory shipments to dealers are increasing.

Delay in large production of the Ford models is helping to some extent in swelling the totals of other manufacturers, but aside from this, vigorous sales campaigns are being conducted in which the dealers are receiving increased support from manufacturers. Though weather conditions are uniformly good throughout the country, the used car market is dull and this exerts a temporary retarding effect on new car sales.

Increased attention being given by manufacturers to used car conditions promises much better merchandising of these cars during 1928. Dealers will have the assistance of specialized factory executives in promoting sales of both new and used cars, and many factories have plans now under way to make sales conditions much sounder during the present year.

### Four Companies Report Higher January Sales

PHILADELPHIA, Feb. 6—American Hammered Piston Ring Co. reports business for January, 40 per cent larger than for January, 1927. Manley Mfg. Co. reports a \$30,000 increase over January last year. Black & Decker Mfg. Co. report business running about 15 per cent ahead of January, 1927, and a similar increase is reported by the Bonney Forge & Tool Works.

### Studebaker Gains 58%

SOUTH BEND, Feb. 7—Actual retail deliveries of Studebaker and Erskine cars during January were the largest in Studebaker history, and were 58 per cent larger than in January, 1927, according to statement today by A. R. Erskine, president of the Studebaker Corp. of America. That gain in sales is nation wide is indicated by the fact that 22 out of 23 Studebaker branch territories contributed to the increase.

### Peerless Shipments Rise

CLEVELAND, Feb. 7—Actual shipments of Peerless automobiles for January are greater than any January in Peerless Motor Car Corp. history, with the single exception of 1926.

## Balloon Rims Gain in January Output

CLEVELAND, Feb. 7—Rims for 21-in. balloon tires led the list in production for January, with 715,931 inspected and approved by the Tire & Rim Association of America, Inc. The figure for the same size in January, 1927, was 842,370.

Comparative figures on important sizes follow:

Size	Jan., 1928	Jan., 1927
30 x 3½ clincher	42,306	121,182
18-in. Balloons		
18 x 4	116,707	52,634
19-in. Balloons		
19 x 3½	81,346	3,456
19 x 4	175,035	24,886
19 x 4½	66,404	38,095
20-in. Balloons		
20 x 3½	46,655	6,880
20 x 4	261,867	144,309
20 x 4½	61,065	17,131
20 x 5	45,525	11,225
21-in. Balloons		
21 x 3½	70,730	491,031
2.75-21-11	502,937	
21 x 4	81,935	235,163
20-in. Truck		
30 x 5-20	128,020	135,958
32 x 6-20	15,429	15,426

## AC Promotes Officials, January Sales Gain 25%

FLINT, Feb. 8—Four executives of AC Spark Plug Co. have been promoted by B. W. deGuichard. R. B. Vessey is now assistant to the manager; L. B. Berge is manager of manufacturing; George Mann, Jr., is assistant secretary in addition to assistant treasurer, and W. J. Langdon is assistant comptroller.

January production was 25 per cent larger than January last year, Mr. deGuichard said.

## Auburn Earns \$1,278,532

AUBURN, IND., Feb. 8—Net earnings of Auburn Automobile Co. in 1927 rose to \$1,278,532 after taxes and charges, equal to \$13.09 a share, E. L. Cord, president, has reported. Earnings in 1926 totaled \$943,262. Working capital was \$5,879,686.

## Trans-Atlantic Line Interests Coolidge

WASHINGTON, Feb. 8—Belief that a line of dirigibles to ply between London and New York is practicable and feasible was expressed at the White House this week. So "sold" is the President on the idea that he has asked Secretary Hoover to investigate the plan now being formulated and to extend any assistance to the American interests in the project that may be necessary.

The announcement was made at the White House after the President was apprised of the fact that one of these airships already has been constructed to carry 100 passengers and make the passage from London to New York in 38 hours.

## Dowell Joins Murray, McArdle Gets New Post

DETROIT, Feb. 8—John McArdle, who joined the Murray Corp. of America, in November, has been appointed assistant to the president and will have charge of bus body sales, advertising and sales promotion.

A. P. Dowell has been named works manager of Murray. For 12 years he was with Briggs Mfg. Co., part of which time he served as vice-president and assistant general manager. For the past seven years he has been associated with Fisher Body Corp., resigning as manager of Fisher plant No. 21 to join Murray. F. A. Selji has been appointed manager of the bus body manufacturing division.

## Seeks Air Line Franchise

PHILADELPHIA, Feb. 8—Pittsburgh Eastern Air Lines Co. has filed application for an airplane passenger line between Philadelphia and Pittsburgh with the state public service commission. Ford and Stinson planes would be operated in conjunction with a line connecting Pittsburgh with Detroit, carrying five to 12 passengers. In addition the company would provide spare Wright Whirlwind engines for frequent overhauls.

## M. T. A. Holds Dinner

NEW YORK, Feb. 9—The annual dinner and smoker of the Motor Truck Association of America was held in the Hotel McAlpin, Feb. 8. The speakers were C. A. Hartnett, commissioner of motor vehicles of New York City, and Deputy Commissioner Frank J. Ryan.



## Brosseau Tells I.C.C. Control Impractical

Only 1 Per Cent of Trucks  
Affected by Examiner Re-  
port—Cites Railroad Use

WASHINGTON, Feb. 10—Serious objections to placing motor bus and truck interstate traffic under Federal control, as proposed by Examiner Flynn's report to the Interstate Commerce Commission, was registered today by the National Automobile Chamber of Commerce and a number of other national and state organizations at the hearing on this report.

A. J. Brosseau, vice-president of the N.A.C.C. in charge of the truck division and chairman of a special committee of that body to consider the I.C.C. report, presented a vigorous argument showing why the report should not be adopted. Mr. Brosseau took up specifically the recommendations of the report as follows:

"After a full and thorough study, we find practically no evidence in the record which shows any demand on the part of either the general public or the shippers for the regulation of the motor truck as a common carrier in interstate commerce.

"Further we find no facts in the record which show a need for the regulation of these vehicles as common carriers, in the public interest.

"In spite of this the examiner recommends regulation—

"But he exempts all of the trucks which are used in the account of private business.

"He exempts all contract carriers. The sum of these two classes of truck movement, the examiner says, is 98 per cent of the total.

"Finally, he would give the commission authority to exempt any part of the remaining 2 per cent of the movement which it may think desirable to exempt.

"The net result, then, is that the full weight of governmental regulation is to be exerted to control approximately 1 per cent of the total movement.

### Furnishes Different Service

"The evidence is conclusive that the truck furnishes a different character of service and one which the railroads are not equipped to render.

"According to no less a railroad authority than L. F. Loree, 25 per cent of the railroad equipment in the past has been dedicated to a haulage of less than 5 per cent of the total movement. Thousands of miles of railroad have been built and placed in operation which have never been justified on any ground except that they were built before there was any other agency to fulfill the short haul needs of the shipper.

"The record shows that today leading railroads are making use of the motor

truck in many of these operations and by so doing they are giving to the public a more complete transportation service than ever before and at lower cost."

Mr. Brosseau went on to point out that motor buses differ from trucks in that they are of greater service when operated over fixed routes between different definite points and on regular schedules. Buses, therefore, lend themselves more readily to such control than do trucks. He pointed out, however, that it is not desirable to attempt fully to regulate bus transportation until the effects of this regulation are thoroughly understood.

## Two States Announce Save-A-Life Drives

CHICAGO, Feb. 8—Following successful campaigns in New York, Massachusetts and Maryland, the states of Louisiana and Alabama have announced Save-A-Life inspection periods, according to Harry G. Moock, managing director of the Automotive Equipment Association Greater Market Development, which originated the Save-A-Life idea.

Governor Simpson of Louisiana has issued a proclamation setting the dates from Feb. 15 to March 3 as the inspection period. In Alabama the dates will be from Feb. 20 to March 17, according to Governor Graves' proclamation.

The Save-A-Life campaign is built around the thought that the best driver in the world cannot stop a car if the car has no brakes and, therefore, the car should be inspected as well as its driver.

### To Launch Sales Campaign

CHICAGO, Feb. 9—Announcement has been made by Harry G. Moock, managing director of Greater Market Development of the Automotive Equipment Association, of a direct-by-mail campaign to reach 50,000 automotive dealers, garages and service stations, the keynote of which will be "Diversify and Prosper."

## Comfortable Prosperity in 1928, Says McComb

CHICAGO, Feb. 4—J. M. McComb, newly elected president of the Motor & Accessory Manufacturers Association, addressing a group of members during the Chicago show, said 1928 will mark the return of comfortable prosperity. An orderly revival of business is now under way which, he said, would be accomplished without overproduction or incidental evils likely to bring a later reduction. Conditions are ripe, he declared, for a steadier and longer era of good business than for the past three years.

## DeHaviland Picks Leaside

TORONTO, Feb. 8—The De Haviland Aeroplane Co. of England after much investigation will locate at Leaside as the site of the Canadian assembling plant.

## Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co.

NEW YORK, Feb. 9—Advance in the rediscount rate of the Federal Reserve Bank of New York from 3½ to 4 per cent last Thursday has been the chief financial development of the past week. The continued improvement in the basic industries has been reflected in the increased operating schedules in the iron and steel business. An increase to 4 per cent in its rediscount rate was announced by the Minneapolis Federal Reserve Bank this week. Cotton prices have declined to the lowest price in five months, while corn prices have risen in response to larger demands for export.

### FREIGHT CAR LOADINGS

Railroad freight car loadings in the week ended Jan. 21 declined, numbering 884,095, as compared with 906,734 in the previous week and 936,160 in the corresponding period last year.

### PETROLEUM OUTPUT

Production of crude petroleum decreased in the week ended Jan. 28, average daily output being 2,355,250 bbl., which compares with 2,380,900 bbl. a week earlier and 2,370,350 bbl. in the corresponding period a year ago.

### FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices rose fractionally last week to 96, as against 95.6 in the preceding week and 95 four weeks earlier.

### BANK DEBITS

Bank debits to individual accounts, as reported to the Federal Reserve Board for the week ended Feb. 1, were 9.3 per cent above the total of the previous week, and 8.5 per cent greater than the amount reported in the like period last year.

### FEDERAL RESERVE REPORT

For the same interval the Federal Reserve banks reported that discounts increased \$38,200,000, open market purchases \$30,100,000, and deposits \$50,300,000. Reserves declined \$17,400,000, U. S. Government securities \$7,200,000 and note circulation \$7,900,000. Member banks reported that in this period loans and discounts rose \$89,777,000, demand deposits \$106,945,000 and borrowings from the Federal Reserve banks \$38,046,000. Investments decreased \$12,579,000.

Time money rates were higher last week at 4½ to 4¾ per cent. Rates for commercial paper remained unchanged at 3¾ to 4¼ per cent.

## Chevrolet Adds Equipment

TOLEDO, Feb. 6—Chevrolet Motors Ohio Co. has received machinery and equipment valued at \$750,000 to be installed at once to boost production from 6500 to 7000 transmissions a day. More than 3000 employees are now at work in the plant here. The company makes all transmissions for Chevrolet and Pontiac cars.

## Ford Output Totals Far Below Estimates

Only Half of January Schedule  
Realized Due to Produc-  
tion Difficulties

DETROIT, Feb. 6—Through a series of circumstances which have developed since the Ford Model A was announced, production of the new car is not meeting with the original expectations of Ford Motor Co. Indications are that large quantity output is still some weeks away. Because of the situation many Ford dealers in the Detroit area have withdrawn new cars from their display floors and are concentrating on selling used cars and in promoting service work until such time as they can realize on sales of the new product.

When the car was announced the Fords made it known they expected to attain a production of at least 1000 cars a day by the end of January and 2000 daily by the end of February. From what can be learned it appears the output has barely reached half the figure set for January with result that dealers are able to obtain only a minute fraction of cars required to fill orders on hand.

The Ford company now has 91,000 men on its payrolls and reports emanating from Fordson are to the effect that considerable progress is being made in the manufacture of certain units for the car. These are being distributed among the various assembly plants to be held in readiness for large assembly operations.

It is reported that certain suppliers of units have not been able to deliver parts on schedule and this also has operated against carrying out the original plans. Perhaps the most serious problem facing the company is the necessity of providing an additional parking brake to meet technical requirements of motor vehicle laws in several states and also unusual difficulties the company has experienced getting its final assembly lines functioning.

### New Training Necessary

Because Ford plants were closed for so long a period and because the new car must be assembled with much more accuracy and precision than the Model T the company has been compelled at great expense to train new personnel to man the assembly lines in the various Ford plants throughout the world. It is reported that the delays have been partly due to Henry Ford's determination to have the car absolutely right before it goes into the public's hands with the result that the slow procedure is costing heavily.

In refuting persisting rumors that he will abandon the five day a week program which was adopted some time ago and work six and seven days Henry Ford declares the five day program would continue.

### Through Bus Tickets Soon to be Issued

NEW YORK, Feb. 6—Announcement of a plan whereby motor bus transportation tickets may be purchased to carry passengers through from New York to California is promised within the next 30 days by one of the Wall Street brokerage houses.

## Competition Hurting Morale, Says Banker

NEW YORK, Feb. 6—The automobile industry faces serious difficulties, on account of competitive conditions, unless manufacturers turn their attention immediately to devising methods for maintaining the morale of distributor organizations, according to a statement by Reginald Roome, president of the Excelsior Savings Bank, many of whose depositors are automobile distributors.

Increased competition, particularly in the low priced field, is going to subject distributors to tremendous pressure, especially on terms, trade-ins and extras, in Mr. Roome's opinion. He sums up the situation as follows:

"The fierceness of the competition cannot be judged from the fact that there was only half the number of exhibitors at the 1928 show that there was seven years ago. A more important fact is that 56 per cent of the manufacturers showed three or more lines of cars, as against 37 per cent last year. In 1926, six manufacturers put out new lines in different price classes; in 1927 six more new lines were added, and in 1928 13 more. Of these 25 new lines, 14 were lower priced lines by producers of higher priced cars."

### Marmon to Build 45,000

INDIANAPOLIS, Feb. 6—Directors of Marmon Motor Car Co. today declared the regular dividend of \$1 per share on the common stock of the company to stockholders of record Feb. 15, payable March 1. Simultaneously they approved production of 45,000 straight-eight automobiles for 1928. This action is the result of the rapid increase in unfilled orders following successful introduction of the new Marmon "68" and "78" at automobile shows in New York, Chicago and elsewhere. Present production is on a basis of 200 to 215 cars a day.

### Moltrup Opens Office

PHILADELPHIA, Feb. 6—Moltrup Steel Products Co., Beaver Falls, Pa., has discontinued its connection with Henry Stewart & Co., this city, and has opened its own branch office at 617 Widener Bldg., with Russell E. Crank in charge as district manager of sales.

## Steel Prices Show Increasing Firmness

Incentive Toward Price Cuts  
Passes as Production Reaches  
High Rate

NEW YORK, Feb. 9—Recent price advances in full-finished automobile sheets, fender stock, and cold-finished steel bars have not yet become fully established but there is no question that the market's plasticity is giving way to steadily increasing firmness. Automotive demand has reached a level permitting finishing mills to operate at so satisfactory a rate that the incentive to cut prices has disappeared. Concessions to large buyers on attractive specifications are likely to continue, but the acute keenness of competition that characterized the steel market up to a few weeks ago is no longer in evidence.

The leading interest's unfavorable financial report for the final quarter of 1927 served to accentuate the industry's determination to obtain better prices. Rumors continue that further integration among "independents" will result in a realignment of the dominant market factors. The \$3 per ton advance in fender stock prices to 4.30 cents, Pittsburgh, for 20-gage and 4.35 cents for lighter cold-rolled strip steel, was first announced by an Ohio independent for deliveries during the remainder of the current quarter, prices on second-quarter deliveries to be determined later.

The advance followed on the heels of announcement that "independents" had marked up the price for full-finished automobile sheets \$3 a ton to 4.15 cents, Pittsburgh. The latter upward price revision was really in the nature of a reinstatement of the price that had prevailed up to the time that general disintegration overtook the sheet market last year. Later, advances on black and blue annealed sheets were announced, but full-finished automobile sheets remained at the level to which last year's depression had carried them.

While makers of full-finished sheets are obligated for considerable tonnages at old prices, the 4.15 cent level applies to all new business.

**Pig Iron**—Michigan and Ohio automotive foundries continue to take on sizeable tonnages of foundry and malleable iron. In some transactions in the Detroit market sellers obtained an advance of 50 cents per ton. More furnaces are coming into blast, and the market shows more animation all around.

**Aluminum**—Piston makers are working up steadily growing tonnages of aluminum, one specialist alone producing 40,000 pistons a day. The market is steady, with automotive consumers anticipating their requirements somewhat more freely.

**Copper**—Following the purchase by wire-drawing interests of metal at 14½ cents, delivered Connecticut, the market again turned very quiet, although demand from makers of automotive brasses is better.



## Grahams to Oppose Unsound Practices

Impress Dealers With Need  
for Operating on Solid  
Business Principles

CHICAGO, Feb. 4—Men of principle make principal men. That was the message brought to 800 Graham-Paige dealers assembled at a luncheon during the Chicago show by Ray A. Graham. He declared that the promise made to the industry when he and his brothers took over Paige-Detroit in June had been fulfilled in January. He promised that the new Graham-Paige company would do everything in its power to stop unwholesome business practices such as giving of high prices on used cars to camouflage what really amounts to a discount.

The luncheon was started with the presentation of Lorado Taft, the famous Chicago sculptor who designed the Graham-Paige emblem. Mr. Taft was followed by Knute Rockne, Notre Dame football coach. Joseph B. Graham followed his brother Ray with a partial description of the new 120 hp. eight which Graham-Paige will shortly present. He emphasized that the factory does not want to oversell its dealers but that it did want to keep its production at a steady pace.

Robert C. Graham arrived in Chicago from San Francisco the morning of the luncheon highly enthusiastic over the sales prospects for the coming year. Seventy-nine orders were written in the coast city during show week and he discovered upon his arrival here that Byrd-Sykes, the local distributors, had sold 87 Graham-Paige automobiles in the first five days of the show. "In June we started with 600 retailers and in December this figure had climbed to 1780," said Mr. Graham. "There still is a big task ahead but this growth certainly indicates that there will be a steady progress."

"The industry has grown by leaps and bounds. Where production formerly was uppermost in the manufacturer's mind he now is bending every effort to enlarge his outlets by helping the dealer. Production now is past the point where the country will absorb automobiles as fast as the factories can make them. Watch your retail salesmen. Compensate them well in proportion to their loyalty and productive effort."

### Moon Orders Gain 50%

CHICAGO, Feb. 6—Advance bookings on Moon cars show an increase of approximately 50 per cent over the same period last year, Stanley Moon said at the close of the Chicago show. He reports the closing of 12 new distributors and the signing of 42 dealers since Jan. 1. Production during the first quarter is expected to exceed original plans and a total sales of 10,000 for the year is generally anticipated.

## Car Registry Fees Fixed Eleven Ways

WASHINGTON, Feb. 4—A survey just made by the American Automobile Association shows that there are 11 methods used by the 48 states in assessing registration fees on private passenger automobiles.

"Seventeen states base the rates on horsepower; 14 states on weight; seven states on horsepower plus weight; one state on a flat rate per car; one state on the cost of a motor vehicle; one state on a cubic inch displacement; one state on value plus weight; one state on value; three states on a flat rate plus weight; one state on selling price plus weight and horsepower; and one state on the manufacturer's list price."

## Dodge Fixes Output of 1650 by March 1

DETROIT, Feb. 6—John R. Lee, general sales manager of Dodge Brothers, Inc., in a statement says the company will be producing as many cars daily by March 1 as it ever has made. Mr. Lee said that the company at the present is turning out approximately 600 of the new Victory Six daily. This schedule will be increased as rapidly as production facilities will permit, so that by Feb. 15 it will total 1000 a day, and by March 1, 1300 a day. The company, he declared, has experienced an increase in demand for the Senior Six since the introduction of the Victory, and total production of four-cylinder Victory and Senior passenger cars and Graham Brothers commercial vehicles will approximate 1650 units daily by March 1.

## New Autocar 3-Ton Six Has Under-Seat Engine

PHILADELPHIA, Feb. 7—A new model six-cylinder, 3-ton truck, designed for use by roadbuilders, has been added by the Autocar Co., Ardmore, Pa. Designated the "Trail Blazer" the new unit has the same under-the-seat engine location as in the companion four-cylinder model HPDS and the same seat structure, dash and control arrangement is employed despite the greater length of the six-cylinder engine. The wheelbase is 114 in.

Overall length of the chassis is 15 ft. 9 in. and the turning circle is 38 ft. Tires are 34 by 7 in. all 'round with duals on the rear wheels.

## Hupp Signs 71 Dealers

DETROIT, Feb. 6—Hupp Motor Car Corp. reports the signing of 71 new dealers in the United States during January.

## Chevrolet Outlines Used Car Activity

Sales Promotion Executive  
Placed in Charge—To Sell  
Six Accessories

CHICAGO, Feb. 4—Plans for the sale of 550,000 Chevrolet automobiles by July 4, or 65 per cent of the output for the year, were discussed by R. H. Grant, vice-president and general sales manager of the company, at the annual Chicago meeting and banquet of Chevrolet dealers and allied bankers.

Mr. Grant made it plain that it is the intention of the company to market 65 per cent of its yearly output by July because he believes the competitive situation makes such a move entirely logical. If the last half of 1928 carries out the present promising outlook the company can sell more than the remaining 35 per cent of the yearly quota by stepping up production, and again set a record.

J. P. Little spoke on Selling Service. Mr. Little's charts showed that of 1359 dealers last year, 489 showed a profit on their shop service. The average profit was \$4.55 per new car sold.

In connection with the Chevrolet balanced stock plan, Mr. Little showed that 65 per cent of the profit is made from 5 per cent of the parts stock. He also announced that the company has, after rigorous tests, decided to furnish its dealers with six standard accessories, three of which are already available. These are chromium plated bumpers, a beautifying radiator ornament and a car heater. R. K. White, who is just taking over supervision of used car sales in all zones, told dealers they would have to buy probably 850,000 used cars this year. Chevrolet has developed under Mr. White's supervision, what is to be called the "Ucap," a system of appraisal pricing which will be sent to each dealer in each zone, and at the end of each month will be compiled and sent back, so that the dealer will be able to gage zone prices in the coming month by those brought by each make of car handled in the month just past.

### Shows Slow Moving Lines

The system not only shows what prices were received for any given make of automobile on the average, but also is so arranged that the dealer can tell at a glance which models and makes were slow to move. Those cars which do not sell at the end of 90 days are listed as bad bargains at any price and the dealers are advised to take no more of them in on new cars.

Mr. White urged the dealers to recondition their used cars honestly. Those which could not be reconditioned without too great expenditure should be junked. As a final argument he insisted that dealers let their salesmen know what used cars are in stock by weekly listings.

# Men of the Industry and What They Are Doing

## Leading Engineers Named to Attend World Congress

Charles F. Kettering, president of the General Motors Research Corp.; Howard E. Coffin, vice-president of Hudson Motor Car Co., and William B. Mayo, chief engineer of Ford Motor Co., have been appointed members of the American Committee of the World Congress of Engineers, to be held in Tokio in November, 1929. The appointments were made by Herbert Hoover, Secretary of Commerce, and honorary chairman. They were announced by Dr. Elmer A. Sperry, chairman. Other members of the committee are: Thomas A. Edison, John Hays Hammond, Charles M. Schwab and Orville Wright.

The congress will be the first of its kind ever held, and, according to Baron K. Furuichi, president of the Engineering Society of Japan, is to promote international cooperation in the study of engineering science and problems in all its branches and to stimulate a sense of brotherhood among the engineers of the world.

## Rickenbacker and Allen on Trip

Capt. E. V. Rickenbacker, recently appointed assistant sales manager of the Cadillac Motor Car Co. and Floyd A. Allen, assistant to the president of General Motors Corp., are leaving on an extended trip. Mr. Rickenbacker will address gatherings of Cadillac-Lafayette dealers while Mr. Allen will speak to groups of General Motors dealers on facts about the General Motors Corp.

## Lewis Vice-President

C. R. Lewis has been made executive vice-president of the Standard Forgings Co., this city, in addition to his duties as general manager of sales. A. C. Stockton, formerly vice-president and comptroller, was elected vice-president, treasurer and secretary in place of L. C. Ryan, formerly treasurer, and C. E. Jernberg, formerly secretary, both of whom have resigned.

## Haynes on Defense Committee

Fred J. Haynes, chairman of the board of Dodge Brothers, Inc., and president of the Detroit Board of Commerce, has been appointed a member of the national defense committee of the Chamber of Commerce of the United States.

## Olds Promotes DeBarry

P. C. DeBarry has been appointed sales promotion manager of Olds Motor Works, succeeding Don Prentiss, resigned. Mr. DeBarry has been connected with Olds for the past four years, during the past two years serving in the sales promotion department.

## Rolls-Royce Head Endows Scholarship

Henry J. Fuller, president of Rolls-Royce of America, Inc., has endowed a scholarship at Worcester Polytechnic Institute to be awarded to the freshman who possesses the greatest amount of "Yankee ingenuity" as exhibited in his elementary and secondary school work. The scholarship is the sustaining type and will yield an income equivalent to the tuition of one student.

## Gabriel Names Sales Heads

H. D. Kinnear has been appointed sales manager in charge of factory sales by Gabriel Snubber Mfg. Co., and J. H. Shoemaker has been appointed sales manager in charge of distribution. Stanley C. Cline, formerly sales manager, has taken over the distribution franchise at Detroit. T. M. Manley has joined Gabriel as supervisor of distributing organization activities, and L. H. Weir has taken over sales supervisory work.

## Beecroft Opens Akron Show

The Akron Automobile Show was officially opened with an address to 250 local automobile men by David Beecroft, vice-president of the Chilton-Class Journal Co., at a luncheon in the Portage Hotel. Mr. Beecroft talked rubber, painted a picture of 1928 for the automotive industry, impressed the importance of the "greatest industry today" and gave a short, comprehensive sketch of the industry since its inception.

## Reichle Joins G.M. Export

W. A. Reichle, formerly engineer in charge of bus body construction for Ruggles Motor Truck Co., has joined General Motors Export Co. in the bus and truck division. W. V. Winslow, personnel manager of General Motors Export, is on a trip to Europe, and G. Baldwin, in charge of parts program work, is on a trip to Sao Paulo. L. M. Rumely, general manager, is on a trip to Mexico and northern South America.

## Macauley on Florida Trip

Alvan Macauley, president of the Packard Motor Car Co. of Detroit, and Lee J. Eastman, president of the Packard Motor Car Co. of New York, left New York, Feb. 4, for a three weeks' trip to Bellair, Fla. They were accompanied by Governor Fuller of Massachusetts, and R. B. Parker, president of the Philadelphia Packard Co.

## Robert Bosch Magneto Adds Territorial Men

Robert Bosch Magneto Co., Inc., held its second Mid-West conference in the south ballroom of the Stevens Hotel, Chicago, Jan. 30. More than 50 representatives of Robert Bosch distributors and service stations from the Middle and Western States were present.

The following additions have been made to the Robert Bosch sales organization: J. H. Connor, formerly with Flint Motor Co. of New York, who will cover territory in and about New York City; R. M. Herbert, formerly with Motor Batteries, Inc., Memphis, who will cover Maryland, Delaware, Washington, D. C., and Virginia; F. J. Mackey, formerly with American Bosch Magneto Corp., who will work in northern New Jersey; E. F. Moss, formerly with the Buffalo Ignition Sales Co., whose territory will be in western New York State; F. P. Burkholder, formerly with Illinois Auto Electric Co., assigned to territory in and about Chicago, and A. F. Wagner, formerly of Wagner Specialties Co., whose territory will comprise Ohio, Kentucky and portions of Indiana.

## Erban in United States

Richard Erban, French inventor, has arrived in the United States, to discuss with associates in this country, American rights to a patent which he holds for a device eliminating the conventional transmission system on automobiles. The device is reported to have been adopted by the largest taxicab operating company in France.

## Valentine Promotes Mitchell

Robert E. Mitchell has been appointed sales promotion manager for Valentine & Co. He was formerly a Valentine district sales manager, and previous to that had spent several years in advertising and promotion work.

## Rice on Tax Committee

H. H. Rice, assistant to the president of General Motors Corp., has been appointed a member of special committee of the Chamber of Commerce of the United States, to make a nation-wide study of state and local taxation.

## Czechs Honor Nichols

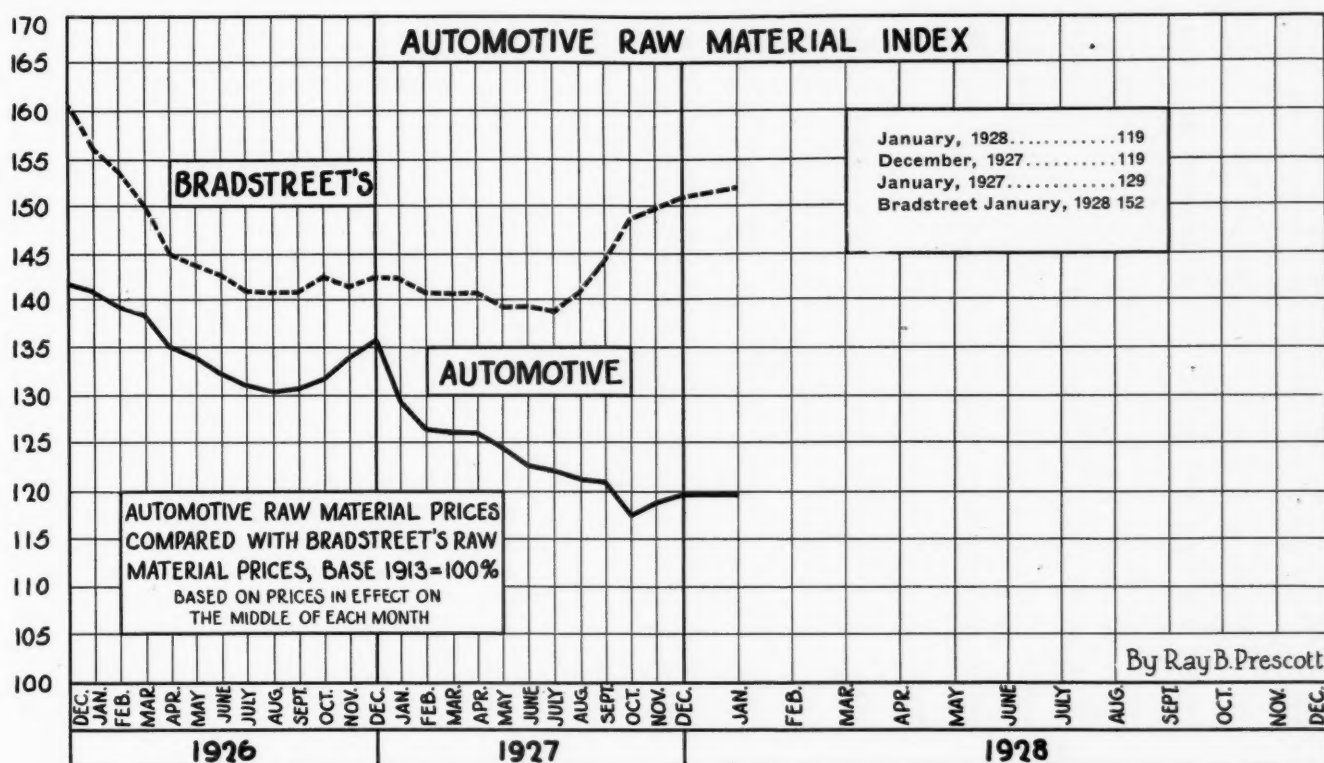
W. W. Nichols, vice-president, mechanical engineer, of D. P. Brown & Co., Detroit, has been notified that he has been made a foreign member of the Masaryk Academy of Work at Prague, Czecho-Slovakia.

## Fokker Back From Europe

Anthony H. B. Fokker, consulting engineer of the Atlantic Aircraft Corp., and Mrs. Fokker, have returned from a business trip in Europe.



# Raw Material Prices Hold December Level



## New Campbell Racing Car Has Napier-Lion Engines

NEW YORK, Feb. 7—Captain Malcolm Campbell, defender of the British automobile speed record, arrived in New York today on the Berengaria with a new racing car, the Bluebird, constructed under his supervision. The car is powered by Napier-Lion type engines with a rating of 900 hp. about which considerable secrecy is being maintained. The engines are similar to those which were in the plane winning the Schneider cup in Venice last year.

The Bluebird, with the present chassis and engines, did 187 miles an hour on the sands at Pendine, Wales, under extremely adverse conditions. The sands there are so soft that skids had to be placed under the car when it came to a standstill in order to prevent it from sinking. It is expected that all previous records will be broken when the Bluebird gets on the hard sands of Daytona Beach later this month.

## Reo 1927 Shipments 46,375

LANSING, Feb. 7—Shipments of Reo Motor Car Co. in 1927 totaled 46,375 cars and trucks as against 31,952 in 1926. Shipments in January, this year, totaled 2384 against 2322 the year previous.

## Jordan Shipments Double

CLEVELAND, Feb. 6—Edward S. Jordan, president of Jordan Motor Car Co., reports shipments for January

were more than double those in January, last year, with definite indications of good business through the first quarter. Much greater interest is being displayed at the shows, he said.

## Chicago Used Car Stocks Show Gains in January

CHICAGO, Feb. 7—Used cars on hand in the Chicago Federal Reserve district Jan. 1 were 9.9 per cent larger than the month previous but 10 per cent lower than the year before. There was a gain in value of 0.2 per cent over the previous month and 15.7 per cent over the previous year. Retail sales of new cars were 12.3 per cent lower than the month previous and 46.2 per cent lower than the former year. There was an increase of 1 per cent in new car stocks over the former month and a gain of 7.6 over the former year.

## Cleveland Used Car Sales Lower

CLEVELAND, Feb. 6—Used car sales in January fell an even 300 below the mark for the same month last year, Herbert Buckman, secretary of the Cleveland Automobile Manufacturers & Dealers Association, reports. New car sales were 1446 against 1460 last year.

## Detroit Sales Gain 511

DETROIT, Feb. 3—Sale of new passenger cars in Wayne county in January aggregated 3058 compared with 2547 in the same month last year. Commercial vehicle sales in January totaled 232 compared with 429. Chevrolet led with 812, followed by Essex with 540. Ford titled 126.

## Glenn L. Martin Plant is Moved to Baltimore

WASHINGTON, Feb. 8—Transfer of the Glenn L. Martin Co. plant from Cleveland to Baltimore has been announced by the Navy Department. Negotiations for the abandonment of the Cleveland site and building of a new one in Baltimore have been under way for more than a year, it was announced by Glenn L. Martin, aeronautic designer and owner of the concern.

The reason assigned for the transfer was that the concern is engaged in several large contracts for the Navy, the total awards aggregating \$7,000,000.

## Financial Notes

Lancia Motors Co. of America has increased its capital from \$1,000,000 to \$3,000,000, consisting of 100,000 shares of \$25 preferred stock and 100,000 shares of \$5 par common stock. The company, which recently purchased the Fiat plant in Poughkeepsie, expects to be in production about July 1 with an output of 250 cars a month. The plant has a capacity for production of 25,000 cars annually.

Wire Wheel Corp. has approved the ten-for-one stock split-up which was recommended by the directors. This split-up was designed to effect a wider distribution of the stock.

Borg & Beck Co. reports net income of \$1,004,359 in 1927, equal to \$8.03 a share, as against \$907,222 or \$7.26 a share earned in 1926.

## British Companies Adopt Joint Symbol

Will be Used to Promote Sale  
of Products in General  
Advertising

LONDON, Jan. 30 (*by mail*)—Since 1924, British car manufacturers have cooperated in inviting the British public to "Buy British" and explaining why this course was justified on economic as well as sentimental and patriotic grounds. Through their association, they have now adopted an emblem which they will use extensively in individual and cooperative advertising. The design represents "Britannia at the Wheel" and its distinct diamond shape is calculated to draw attention to it wherever it appears.

In announcing this step, the Association of British Motor Manufacturers says:

"The adoption of any common symbol by a large number of firms must to some extent, convey to the public the idea that these firms are working together. Such collaboration could never take place without mutual confidence, for no manufacturer would willingly imply close association between himself and any concern which did not offer good value for money and

manufacture goods calculated to reflect credit on the industry.

Thus the adoption of a common symbol implies mutual confidence as well as mutual goodwill between the various manufacturers in the British motor industry. In other words, this development shows that the individual maker is proud of the industry to which he belongs and willing to identify himself with the other firms belonging to it. It would be difficult to conceive any more striking testimony to the efficiency and quality of the British motor industry as a whole."

## Ethyl Gas Stirs England

LONDON, Jan. 30 (*by mail*)—The introduction of ethyl gasoline in this country two weeks ago by the Anglo American Oil Co. (the British offshoot of Standard Oil interests) under the name Pratts Ethyl Petrol, has given rise to controversy resembling that which has occurred in the United States in the past. When Parliament opens next month the question as to the effect of its use upon public health will be raised.

## Mexico Takes 315 Cars

LAREDO, TEXAS, Feb. 4—A total of 315 automobiles were exported from the United States to Mexico through the Laredo port of entry during December. Most of these shipments were destined for Mexico City.

## Road Emergency Service for Owners Inaugurated by G. M. of Canada

DETROIT, Feb. 7—General Motors of Canada, Ltd., has inaugurated a standardized motor road emergency service for the whole of the Dominion. Designed by the engineers at Oshawa, a number of road emergency trucks have been built and are now in service. The corporation announces that within a short time large scale production of these trucks will be started at the Walkerville plant which was recently reopened.

According to H. H. Henchel, general sales manager of the truck and coach division of General Motors products in Canada, every General Motors branch in the country will be equipped with at least one of the new trucks which will carry two men specially trained for road emergency work.

"From the interest shown by our dealers and the orders they have already placed," said Mr. Henchel, "there is every reason to believe that every large dealer in Canada will in a short time secure one of these trucks. This is in addition to those at branches.

The unique feature of the emergency trucks is a meter system of payment. When the emergency truck leaves the garage the meter starts registering so many cents a mile and also a charge by the hour. When the wrecked car is brought to the garage the total amount

due is shown on the meter and the owner of the car gets the regular meter receipt.

Two types of emergency trucks are to be used, one for the truck division, and one for the passenger car division, the only difference is that the passenger car type has a cab front. This cab will seat six persons so that passengers from a wrecked car may be carried.

A crane capable of lifting eight tons, is mounted on each unit. Each truck is also equipped with a rubber-tired dolly capable of carrying six tons., crow-bar, axe, shovel, oil, water and gas tanks, tool cabinet with a full line of tools, jacks, tow-chains, other necessary materials and a completely equipped first-aid kit.

The trucks are painted a shining aluminum with thin red striping. Red safety lights on the front fenders, large searchlights, and two lights on the crane to give sufficient light during operations at night. Trucks also are equipped with a red lantern to be set in the road as a warning and a white one for use around wrecks. For cases of bad accidents at night or in stormy weather where oncoming cars might cause additional injury or interfere with the work, red flare lights are provided, similar to those used on railways.

## Pan-American Views on Highway Sought

Congress Asks Kellogg to Call  
Conference of All Ameri-  
can Nations

WASHINGTON, Feb. 8—A resolution asking Secretary of State Kellogg to call a conference of all American nations to consider the construction of highways connecting the capitals of the Western Hemisphere was passed this week by the House. The secretary is asked to invite a subcommittee of the House committee on foreign affairs to participate in the deliberations. The resolution was the result of hearings on bill HR 447, introduced by Rep. McLeod of Michigan, for the construction of a Pan-American Highway from Detroit connecting North and South America. The creation of a special commission to work for the Pan-American highway is provided for in the McLeod bill, but was opposed by Thomas H. MacDonald, chief of the Bureau of Public Roads. He told the committee he was in favor of the highway but thought the initiative for its construction should come from Latin-American countries. In this he was opposed by J. Alvarez Buenavista, secretary of the Peruvian Embassy, and other Latin-American members of embassies who declared their countries would welcome the United States taking the lead in the matter.

"If more automobiles are to be sold in Latin-American countries, more roads must be built," Mr. MacDonald told the committee. He said on a recent trip to Buenos Aires he saw crated automobiles stacked on the docks almost as far as the eye could reach and that it was impossible to get them all under warehouse roofs. Buenos Aires, he said, was so full of automobiles, that traffic conditions were extremely difficult and yet it was almost impossible to drive outside the city. Buenos Aires therefore, he pointed out, must either develop more roads or use proportionately fewer automobiles.

## Consolidated Gets Contract

WASHINGTON, Feb. 8—The Consolidated Aircraft Corp. of Buffalo, has been awarded a contract for a new type of monoplane-type flying boat for patrol duty by the Navy Department at a price of \$134,000 for the plane, engine and design. The plane will be equipped with the direct-drive Pratt & Whitney "Wasp" engines.

## Eclipse Makes Plane Starter

NEW YORK, Feb. 4—Eclipse Machine Co., Elmira, N. Y., manufacturer of the Bendix starter, is now manufacturing a battery ignition (consisting of generator and distributor) and electric starters, for airplane use in its East Orange, N. J., plant.



## Exports, Imports and Reimports of the Automotive Industry for December and Total for Twelve Months Ending December, 1927

	Month of December 1926		December 1927		Twelve Months Ending December			
	Number	Value	Number	Value	1926 Number	1926 Value	1927 Number	1927 Value
Automobiles, parts and accessories .....	..	\$25,253,559	..	\$27,430,247	..	\$320,178,649	..	\$388,313,816
Electric trucks and passenger cars .....	15	20,326	4	8,987	108	150,088	144	201,040
Motor trucks and buses, except electric (total) .....	3,879	3,320,993	7,136	5,666,087	66,880	47,176,107	105,457	69,913,364
Up to 1 ton, inclusive .....	2,573	1,163,834	5,425	2,804,749	52,184	24,084,004	85,664	40,566,789
Over 1 and up to 2 1/2 tons .....	1,113	1,529,976	1,565	2,376,488	12,414	16,020,452	17,517	22,080,792
Over 2 1/2 tons .....	193	633,183	146	485,450	2,282	7,066,651	2,276	6,660,783
<b>PASSENGER CARS</b>								
Passenger cars, except electric (total) .....	21,787	16,015,642	16,473	14,310,152	238,540	176,432,157	273,742	207,962,257
Value up to \$500, inclusive .....	8,687	3,544,564	2,733	991,471	98,106	38,149,871	63,270	23,450,325
Value over \$500 up to \$800 .....	6,744	4,578,344	3,026	1,715,274	67,187	46,058,936	90,214	50,215,348
Value over \$800 up to \$1,200 .....	5,085	5,264,675	6,922	5,850,640	56,275	59,326,033	83,497	71,298,889
Value over \$1,200 up to \$2,000 .....	712	1,129,066	2,839	3,440,039	11,218	17,274,443	32,429	40,422,571
Value over \$2,000 .....	559	1,498,993	903	2,312,728	5,754	15,624,874	9,382	22,570,124
<b>PARTS, ETC.</b>								
Parts, except engines and tires .....	..	..	..	..	..	..	..	..
Automobile unit assemblies .....	..	1,678,530	..	2,165,820	..	38,534,798	..	41,294,855
Automobile parts for replacement .....	..	3,219,888	..	4,433,410	..	36,074,786	..	50,177,237
Automobile accessories .....	..	660,363	..	565,468	..	9,279,096	..	7,873,568
Automobile service appliances (n. e. s.) .....	..	479,572	..	340,263	..	6,861,746	..	6,994,081
Station and warehouse motor trucks .....	16	6,714	16	17,900	175	178,405	274	196,576
Trailers .....	48	14,027	45	20,625	1,002	347,300	928	419,172
Airplanes, seaplanes and other aircraft .....	14	136,640	11	127,662	50	303,149	63	848,568
Parts of airplanes, except engines and tires .....	..	17,244	..	37,207	..	150,329	..	570,117
<b>BICYCLES, ETC.</b>								
Bicycles and tricycles .....	510	12,109	592	14,119	5,344	150,552	4,838	129,081
Motorcycles .....	1,852	395,812	1,609	356,269	22,670	4,915,949	19,469	4,373,806
Parts, except tires .....	..	96,226	..	118,088	..	1,707,398	..	1,311,726
<b>INTERNAL COMBUSTION ENGINES</b>								
Stationary and Portable								
Diesel and Semi-Diesel .....	156	107,505	90	68,888	894	1,586,821	684	1,166,554
Other stationary and portable:								
Not over 10 Hp. ....	2,311	213,505	2,096	180,857	33,357	3,176,766	28,978	2,583,385
Over 10 Hp. ....	141	131,147	99	61,934	2,842	2,574,584	2,763	1,606,699
Automobile engines for:								
Motor trucks and buses .....	619	62,536	241	30,398	4,265	585,982	5,422	677,754
Passenger cars .....	1,947	264,281	1,664	255,325	114,228	11,940,035	91,631	10,207,741
Tractors .....	138	81,506	93	32,627	2,251	1,196,584	1,267	494,435
Aircraft .....	..	..	..	..	..	..	..	..
Accessories and parts (carburetors) .....	..	315,541	..	181,149	..	4,273,298	..	3,217,735
<b>IMPORTS</b>								
Automobiles and chassis (dutiable) .....	75	132,230	43	123,640	813	1,352,984	635	1,218,938
Other vehicles and parts for them .....	..	6,360	..	16,251	..	151,963	..	259,329
<b>REIMPORTS</b>								
Automobiles (free from duty) .....	7	8,318	22	23,137	188	275,519	181	285,972

### Australia Leading Buyer of U. S. Cars and Trucks

WASHINGTON, Feb. 8—Australia, taking 40,954 passenger cars, valued at \$26,685,615 was the leading customer of the American automobile manufacturer last year, followed by Argentina, taking 34,245, valued at \$21,257,379; Canada taking 34,136, valued at \$26,426,826. Other countries taking more than 10,000 passenger cars included: British South Africa, with 17,880; Denmark, 14,841; Brazil, 14,068; Belgium, 13,686, and United Kingdom, 11,185. Australia was likewise the leading country of export for trucks taking 24,407, valued at \$14,361,174. She was followed by Brazil, taking 11,061; Argentina, 10,554; Denmark, 7569, and United Kingdom, 5475.

#### 1928 Decrease Predicted

WASHINGTON, Feb. 8—A slight increase in truck importations into Australia but a decrease in passenger car imports is predicted during 1928, in a cable to the U. S. Department of Commerce from its representative in Sydney, on current conditions in that country. The motor car trade generally is reported as being pessimistic. Due to favored British duties on cars and trucks, a gain in the British imports is expected. The automotive trend during the past year, as a whole, is regarded as disappointing.

#### Canada Exports Decline

DETROIT, Feb. 4—Production of automobiles in Canada in 1927 aggregated 179,383 vehicles, a decline of 13

per cent from the 1926 figures. The cars were valued at \$117,569,132, a decrease of 6 per cent in the total sales volume. Importation of foreign automobiles into Canada in 1927 increased 28 per cent, a total of 36,630 vehicles being brought into the country. Exports declined from 74,553 in 1926 to 57,792 in 1927.

### Truck Regulation Need Not Shown, Says League

WASHINGTON, Feb. 6—The National Industrial Traffic League has filed a petition with the Interstate Commerce Commission stating that it will require 90 days to act and submit exceptions to the I. C. C. examiner's tentative report. The petition says there is no evidence of demand on the part of the shipping public for the regulation of motor trucks in interstate commerce. Membership in the league is made up of traffic managers of industries and of chambers of commerce throughout the country.

### Morris Would Buy Itala

PARIS, Jan. 24 (by mail)—According to reliable reports, W. R. Morris, the English automobile manufacturer, is negotiating for the purchase of the Itala Automobile Co., Turin, Italy. The firm has been in existence since about 1906, and for the last two years has been in production on a single model six-cylinder of 122 cu. in. piston displacement, built to the designs of Engineer Cappa, who was formerly with the Fiat company.

### Congress May Have Army Use Old Liberty Engines

WASHINGTON, Feb. 4—The War Department appropriation bill, carrying a total of \$399,287,000 for the fiscal year 1929, was reported by the committee on appropriations this week to the House. The bill as reported to the House provides for the purchase of 473 airplanes. During the hearings on the measure, it was stated that the army still has on hand 2000 Liberty engines.

Discussion was had, as to the advisability of the department using these engines in new planes, it being testified that the overhauling would cost \$700 if installed in the plane, as against \$7,000 for a more modern type of engine. The committee reported that no convincing reason was advanced as to why the old Liberty engines should not be used.

### National Aero Buys Plant

NEW YORK, Feb. 6—The National Aero Corp. has secured a plant on the Raritan River, near New Brunswick, N. J., where it plans to produce the Cameron air-cooled aviation engine, shown for the first time last week. The site of the plant includes the facilities for a land and water airplane landing field. The plant has 35,000 sq. ft. of floor space and is partially equipped. The company hopes to start April 1.

### Binks Moves Office

DETROIT, Feb. 6—Binks Spray Equipment Co. has moved its Detroit office to Convention Hall. C. W. Sanders is manager.

## Tire Output Shows 10% January Gain

AKRON, Feb. 6—Production of automobile tires during January exceeded that of the same month last year by approximately 10 per cent, according to preliminary reports from leading rubber manufacturers. Sales to dealers under the spring dating plan showed a healthy increase, and shipments of casings to car manufacturers were well ahead of last year.

Working forces are being steadily increased at Akron tire plants, most of which have three eight-hour shifts a day in operation. Indications are that total sales for the current quarter will be the largest of any first quarter on record.

## Continental Insures Help

DETROIT, Feb. 4—Continental Motors Corp. has made available to its employees and their families, \$4,000,000 worth of old-line life and disability insurance, under the group plan. The insurance will cost each employee 60 cents a month, and is applicable to all those employed by the company who have completed three months of continuous service. New employees are eligible on the same basis.

## Bosch Magneto Sales Gain

SPRINGFIELD, MASS., Feb. 6—American Bosch Magneto Corp. reports magneto sales in December as the best in any month for several years. Similar good volume was maintained in January. Tractors and trucks are a large factor in the demand for magnetos, which now constitute about one-third of the total Bosch production. No marked acceleration in production of ignition systems for the new Ford has yet taken place in this plant.

## Coming Feature Issue of Chilton Class Jour- nal Publications

Feb. 18—Statistical Issue—  
Automotive Industries.

## Shutter Manufacturers Plan Joint Advertising

NEW YORK, Feb. 6—Manufacturers of radiator shutters are proceeding with plans for cooperative advertising and sales promotion effort to develop increased business for their product. The feature of the campaign will be the advancement of the thought that every car needs a radiator shutter from October to May each year.

Companies cooperating in the movement are Allen Auto Specialty Co., Brewer-Titchener Co., Globe Machine & Stamping Co., Irving Engineering Co., J. C. McAdams Co., Metal Stamping Co., and Laminated Shim Co.

## Diamond Adds 2 Models

CHICAGO, Feb. 6—New 1 and 2-ton, six-cylinder trucks priced at \$1,095 and \$1,650, respectively, were introduced by the Diamond T Motor Car Co. at a special showing held at its factory branch in this city during the week of the Chicago automobile show. Both models are equipped with pneumatic tires, the larger one having duals in the rear. The 1-ton model has a 3½ x 4 in. engine, while the 2-ton job has a 3½ x 4½ in. powerplant.

## Gabriel Gets 40,000 Order

CLEVELAND, Feb. 7—Gabriel Snubber Mfg. Co. reports an order for 40,000 sets of snubbers from a car manufacturer.

## Dodge Brothers Sign Largest on Broadway

NEW YORK, Feb. 4—John R. Lee, general sales manager for Dodge Brothers, Inc., this week threw into operation the largest and most brilliant electrical sign on Broadway. This sign, advertising Dodge Brothers, in letters 14 ft. high, extends half a city block in length and is five stories high. The sign stands on the roof of the Strand Theater Building. Approximately 20 miles of wire are utilized and a load of 280,855 watts carried.

The sign itself embodies several new features in illumination, among which is a novel method of operating the motor-graph, or ribbon of running words. This appears as an endless ribbon, unwinding from a spool at one end of the sign and rewinding on the spool at the other end. The letters of the sign are outlined in three rows of lamps, the two border rows being sunk in a trough of polished metal which acts as a mirror, producing the effect of nine rows of lamps instead of three.

## Makes Wood Car Parts

MILWAUKEE, Feb. 6—G. N. Harter, general manager of the I. Stephenson Co. Trustees, operating large sawmills and woodworking plants in the hardwood region of northern Wisconsin and upper Michigan, has announced that the main plant at Wells, Mich., near Marinette, Wis., will begin the manufacture of wood automobile parts about Feb. 1.

## Allerding Sale Feb. 15

MANSFIELD, OHIO, Feb. 7—The Allerding Products Co., manufacturer of steering wheels, will be sold at auction Feb. 15, pursuant to a Federal Court order.

# Calendar of Coming Events

### SHOWS

All Western Road Show, Los Angeles, March 7-11  
American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-28  
Automotive Equipment Association, Coliseum, Chicago...Oct. 22-27  
Berlin...Nov. 8-18  
\*Boston, Mechanics Bldg. ...March 10-17  
Brussels...Dec. 8-19  
Copenhagen...Feb. 23-March 4  
Geneva...March 16-25  
Helsingfors, Finland...Feb. 19-26  
International Aircraft Show, Berlin, March 23-April 11  
Laybach, Yugoslavia...June 2-11  
Leipzig, trucks only...March 4-14  
Lille, France...April 6-22  
London, passenger cars...Oct. 11-20  
Paris...Oct. 4-14  
Prague...Sept. 1-9  
Rio de Janeiro...May 3-13  
Salon Automobile Salon, Inc., Hotel Biltmore, Los Angeles...Feb. 11-18  
Salon, Automobile Salon, Inc., Palace Hotel, San Francisco...Feb. 25-March 3  
Tunis, Tunisia...April 27-May 6  
United States Good Roads Show, Des Moines...May 28-June 1  
Zagreb, Yugoslavia...April 29-May 6

\* Will have special shop equipment exhibit.

### CONVENTIONS

American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-28  
American Gear Manufacturers Association, Hotel Seneca, Rochester, N. Y. ...April 19-21  
American Society of Mechanical Engineers, Joint Meeting of Aeronautic and Wood Industries Divisions, Detroit...June 27-28  
American Welding Society, Engineers Society Bldg., New York...April 25-27  
Automotive Equipment Association, Grand Hotel, Mackinac Island, June 10-16  
Automotive Equipment Association, Coliseum, Chicago...Oct. 22-27  
Highway Engineering Conference, University of Michigan, Ann Arbor, Feb. 14-17  
Highway Transport Congress, Havana, Cuba...Feb. 22-23  
National Battery Mfrs. Ass'n., Edgewater Beach Hotel, Chicago...Feb. 23-24  
National Foreign Trade Council, Houston, Texas...April 25-27  
National Safety Council, Mid-West Safety Congress, Stevens Hotel, Chicago...March 19  
National Safety Council, Central States Safety Congress, Kansas City, April 23-25  
National Safety Council, National Congress, New York...Oct. 1-5

United States Good Roads Association and Bankhead National Highway Association, Des Moines...May 28-June 1

### S. A. E. National

Quebec, June 26-29—Summer Meeting, Chateau Frontenac.

### Sectional

Chicago, Feb. 14—New Developments in Automotive Design—Prof. D. A. Fales.  
Cleveland, Feb. 13—Generation of Electric Current for Automotive Apparatus—B. M. Leece.  
Detroit, Feb. 13—Production of Automobile Frames by Automatic Machinery—John P. Kelley.  
Metropolitan, Feb. 16—Specialized Service.  
Pennsylvania, Feb. 14—Generators and Motors for Gas-Electric Drive—C. A. Atwell.

### RACES

Atlantic City...May 5  
Belgium...Aug. 12  
Daytona Beach, Fla., series of stock car races and world's speed trials, Feb. 15-23  
Detroit...June 3  
Germany...July 15  
Great Britain...Sept. 22  
Indianapolis...May 30  
Italy...Sept. 2  
Spain...July 29